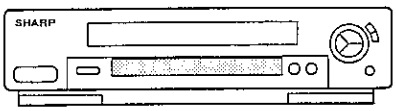
719909

SHARP

SERVICE MANUAL
维修手册

S86O7VC-MA33/



VC-MA33
VC-MA223

VC-MA55
VC-MA443

VHS VIDEO CASSETTE RECORDER
VHS 盒式磁带录象机

MODELS
型号

VC-MA33
VC-MA55
VC-MA223
VC-MA443

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

为了用户安全起见(根据一些国家的安全规程的需要)，应将录象机保持于最初状态，而且只能使用与指定物相同的部件。

The model number of this unit has different suffixes for different destinations. Look at the model number label that is attached on the back of the unit. For servicing this model, be sure to check the suffix (example : "A") at the end of the model number on the label.

本型号标签上的尾标根据外销地区的不同而有差异，因此，在进行这些型号的保养维修时，必须先确认产品背面标签上所记载的型号尾标与序号尾标(例：(A))，然后再进行保养维修。

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SHARP CORPORATION

PRECAUTIONS IN PART REPLACEMENT

When servicing the unit with power on, be careful to the section marked white all over.
This is the primary power circuit which is live.
When checking the soldering side in the tape travel mode, make sure first that the tape has been loaded and then turn over the PWB with due care to the primary power circuit.
Make readjustment, if needed after replacement of part, with the mechanism and its PWB in position in the main frame.

(1) Start and end sensors: Q851 and Q852

Insert the sensor's projection deep into the upper hole of the holder (LHLDZ1893AJ00). Referring to the PWB, fix the sensors tight enough.

(2) Photocoupler RH-FX0005GEZZ: IC901

Refer to the symbol on the PWB and the anode marking of the part.

(3) Cam switches A and B (RH-PX0238GEZZ): D852 and D853

Adjust the notch of the part to the white marker of the symbol on the PWB. Do not allow any looseness.

(4) Take-up and supply sensors (RH-PX0252GEZZ): D855 and D854

Be careful not to confuse the setting direction of the parts in reference to the symbols on the PWB. Do not allow any looseness.

(5) Diode bridge (RH-DX0083GEZZ): D901

Adjust the + marking of the part to the symbol's cathode marking on the PWB.

零件更换时的注意事项

在需要对本录象机进行带电保养检查时，对所有注有白色标记的部分均应特加小心注意。
注有白色标记的部分为初级电源电路部分。
在进行走带状况检查调整过程中检查印刷电路板焊线面时，应先确认磁带的装挂状态符合要求，再边注意初级电源电路边翻转其印刷电路板进行检查。
如更换了零件，将盒室机构及其印刷电路板安置就位后，重新进行调整。

(1)带头、带尾感应器：Q851、Q852
将两感应器的凸销分别深插于插座(LHLDZ1893AJ00)上面插孔之中，并相对于盒室机构分别将其紧固之。

(2)光电耦合器(RH-FX0005GEZZ)：IC901
参照盒室机构印刷电路板以及该部件阳极端的标记。

(3)凸轮开关A和B(RH-PX0238GEZZ)：D852和D853
调该部件的槽口部于盒室机构印刷电路板的白色标记处。扣紧之，切勿让其产生任何松动。

(4)卷带盘、供带盘感应器(RH-PX0252GEZZ)：D854和D855
参照盒室机构印刷电路板上的所有标记，切勿混淆这两个感应器的设定方向。扣紧之，切勿让其产生任何松动。

(5)二极管电桥(RH-DX0083GEZZ)：D901
调该零件的＋标记于盒室机构印刷电路板上的阴极处。

1. SPECIFICATIONS

Format:	VHS PAL/NTSC standard
Video recording system:	Rotary, slant azimuth two head helical scan system
Video signal:	PAL/SECAM/NTSC colour or monochrome (CCiR system B/G, I, D/K) signal
Recording/playing time:*	NTSC: 240 min (SP) 480 mm (LP) (at max. with SHARP E-240 tape) PAL: 160 min (SP) 480 mm (EP) (at max. with SHARP T-160 tape)
Tape width:*	12.7mm
Tape speed:	NTSC: 23.39 mm/s (SP) 11.70 mm/s (LP) PAL: 33.35 mm/s (SP) 16.67 mm/s (LP) 11.12 mm/s (EP)
Antenna:	75 ohm unbalanced
Receiving channel:	VHF Channel NZ1 - S41 (45.25 - 433.25 MHz) UHF Channel E21 - C57 (471.25 - 863.25 MHz)
RF converter output signal:	UHF Channel E39 channel (C26) (E30 - 39 adjustable)
Power requirement:	AC110V-240V, 50/60Hz
Power consumption:	Approx. 17 W (240V AC, 50Hz)
Operating temperature:	5°C to 40°C
Storage temperature:	–20°C to 55°C
Weight:	Approx. 3.5 kg
Dimensions:	380 mm (W) x 290.5 mm (D) x 93 mm (H)
VIDEO	
Input:	1.0 Vp-p, 75 ohm
Output:	1.0 Vp-p, 75 ohm
S/N ratio:	PAL: 45 dB (SP)
Horizontal resolution:	PAL: 250 lines (SP)
AUDIO	
Input:	Line: –8 dB, 47k ohm
Output:	Line: –8 dB, 1k ohm
S/N ratio:	42 dB mm
Frequency responce:	80 Hz ~ 10 kHz (SP)
Accessories included:	75 ohm coaxial cable Operation manual Infrared remote control Battery (2pcs.)

*: (LP) and (EP) is available to Model VC-MA55A/B/D/K/L/S/W and VC-MA443R

As part of our policy of continuous improvement, we reserve the right to alter design and specifications without notice.

Note: The antenna must correspond to the new standard DIN 45325 (IEC 169 - 2) for combined UHF/VHF antenna with 75 ohm connector.

BEFORE RETURNING THE VIDEO CASSETTE RECORDER

In addition to the checks necessary as a result of a repair having been carried out, the following additional safety checks should also be made before returning the unit to the user.

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the Video cassette recorder.

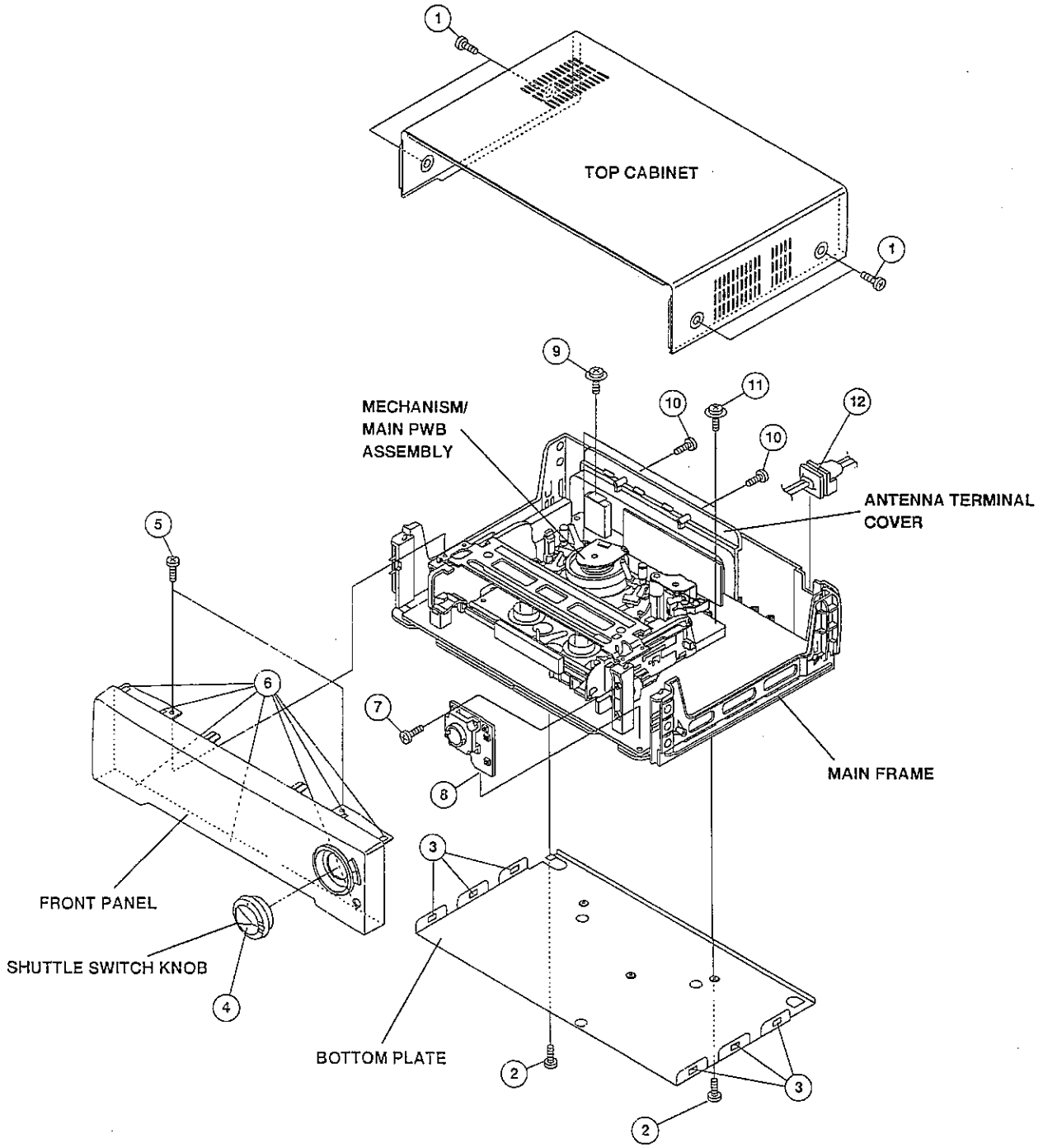
2. Inspect all protective devices such as non-metallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks,mechanical insulators etc.

3. Apply test voltage of 3000 volts between live parts and accessible metal parts for 3 seconds.

2. DISASSEMBLY AND REASSEMBLY

2-1 DISASSEMBLY OF MAJOR BLOCKS

TOP CABINET	: Remove 4 screws ①.
BOTTOM PLATE	Remove 2 screws ② and 6 hooks ③.
FRONT PANEL	: Remove shuttle switch ④.
	Remove 2 screws ⑤ and 7 clips ⑥.
OPERATION PWB	: Remove 1 screw ⑦ and take it out of connector ⑧.
MECHANISM/ MAIN PWB ASSEMBLY	: Remove 1 screw ⑨, 2 screws ⑩, 2 screws ⑪ and 1 connector ⑫. Lift the antenna terminal cover and take the assembly out of the main frame.



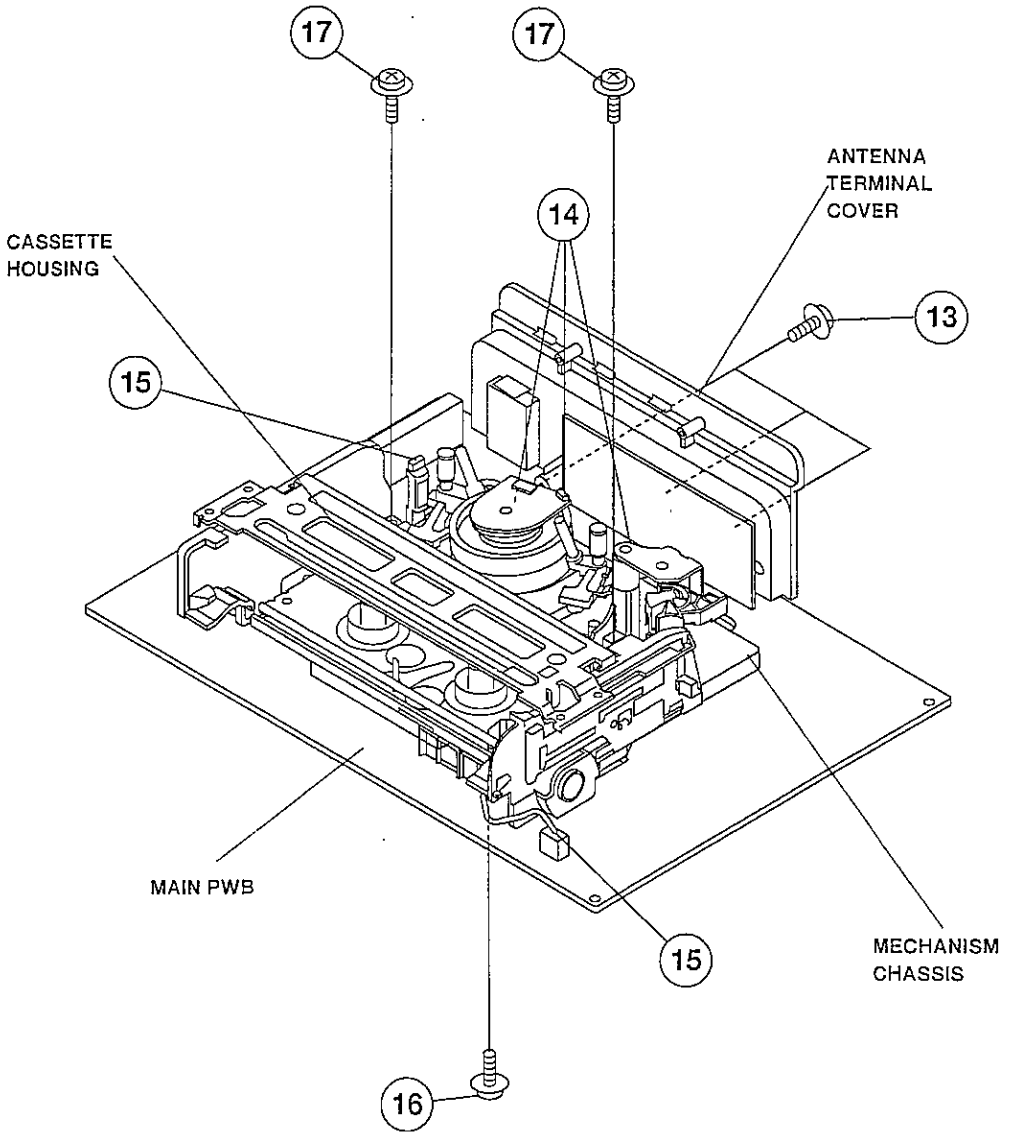
2-2 DISASSEMBLING THE MECHANISM/MAIN PWB ASSEMBLY

ANTENNA TERMINAL COVER : Remove 3 screw ⑬. Remove the shield case.

MECHANISM CHASSIS/ : Remove 3 FFCs ⑭ and 2 harnesses ⑮.
Be carefull not to confuse the top and bottom of the FFC. Remove 1screw ⑯ from behind the main PWB.
Remove the mechanism chassis assembly straight up from the main PWB with care not to damage theirs urrounding parts.

CASSETTE HOUSING ASSEMBLY

CASSETTE HOUSING : Remove 2 screws ⑰.



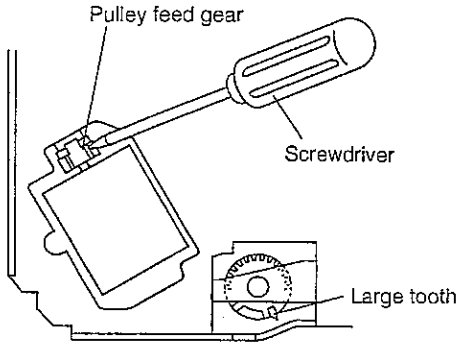
2-3 PRECAUTIONS IN REASSEMBLING

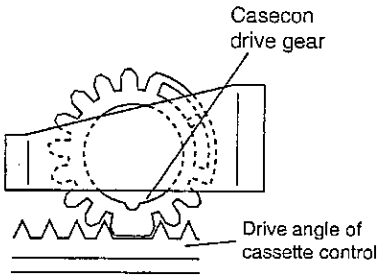
MOUTING THE CASSETTE CONTROLLER

Initial setting is indispensable before placing the cassette controller in the mechanism. The initial setting is made in two ways; electrical and mechanical.

Electrical setting:

Make a short-circuit between TP703 and TP704 and be sure that the mechanism is back to its initial setting position (*1). Now place the cassette controller in position. (This method is used when the mechanism has been already set on its PWB.)





Mechanical setting:

Turn the loading motor's pulley feed gear using a screwdriver and be sure that the mechanism is back to its initial setting position (*1). Now place the cassette controller in position. (This method is applicable for the mechanism alone.)

COUPLING THE MECHANISM TO THE PWB

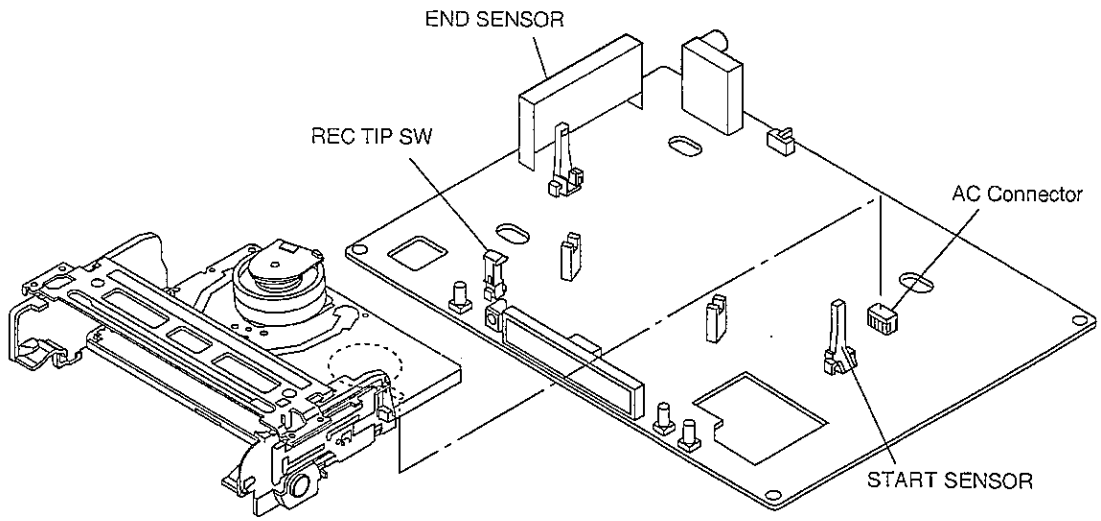
Match the mechanism's projections with the two symbols (round reference and oval sub-reference) on the main PWB. Place the mechanism straight down in position with due care so that the mechanism chassis's outer edges should not damage any parts nearby.

Tighten up the two screws (one for fixing the mechanism and the head amplifier shield, the other on the main PWB's soldering side and located near the loading motor) to fix the mechanism and main PWB. Reconnect the FFC cables (AN and AS) and harness (AB) between the mechanism and main PWB.

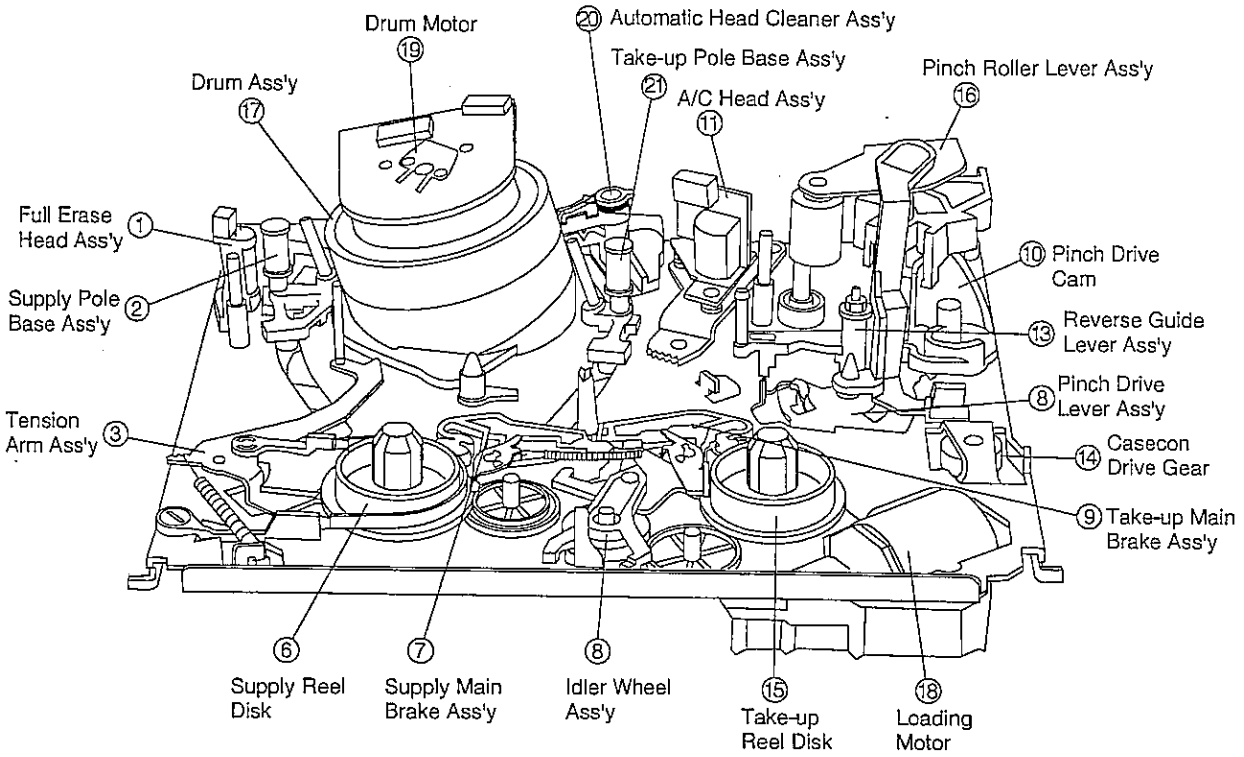
Parts to pay attention to:

Start and end sensors	Q851 and Q852
Rec tip switch	S851

Take special care of the AE connector (board to board) between the mechanism and main PWB.

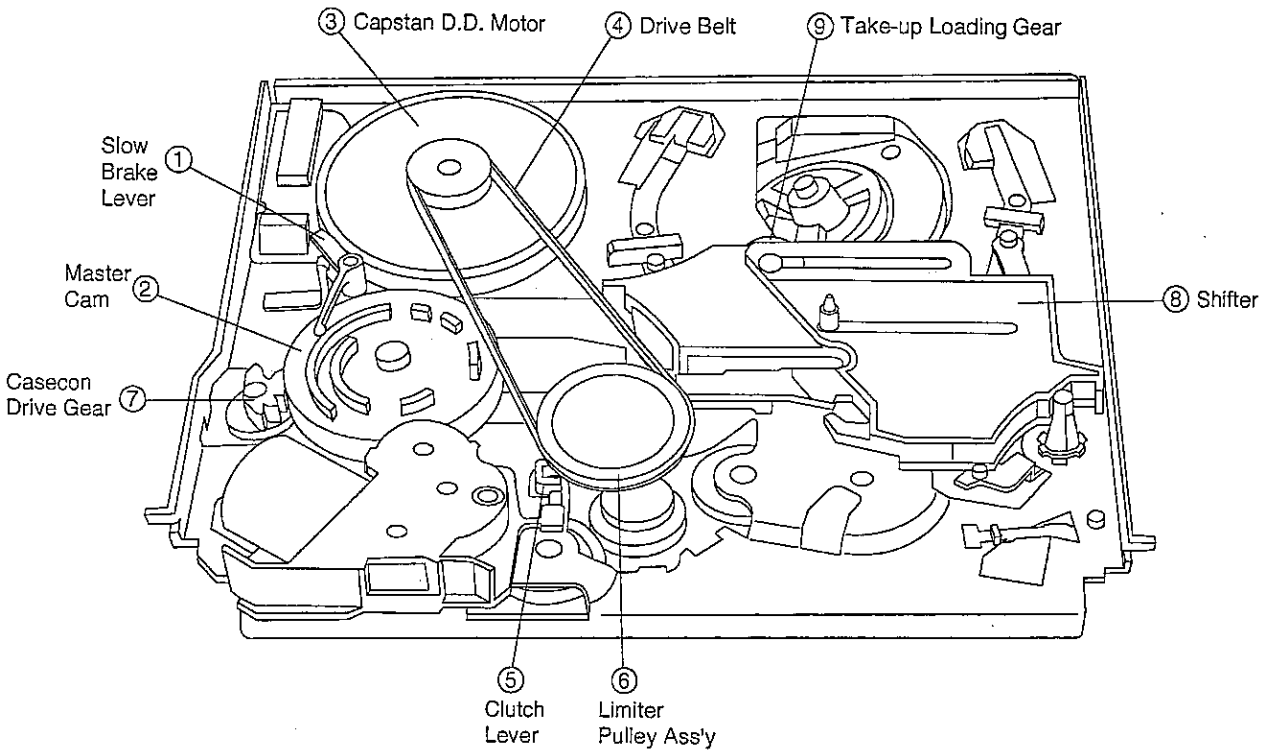


3. FUNCTION OF MAJOR MECHANICAL PARTS (TOP VIEW)



No.	Function	No.	Function
1.	Full erase head ass'y Erase the old recording on the tape in the recording mode.	13.	Reverse guide lever ass'y Pulls out the tape and controls the tape drive train height with the upper and lower guides.
3.	Tension arm ass'y Detects the tension of tape while running, and brakes the supply reel disk via the tension band.	16.	Pinch roller lever ass'y Press-fits the tape to the capstan during tape running.
7.	Sup Main brake Ass'y Brakes the supply reel disk to prevent tape slackening when the unit is stopped in fast forward or rewind mode.	18.	Loading motor A motive power which drives the mechanism. It transmits the power to the master cam and cassette housing control assembly.
9.	Take-up main brake Ass'y Brakes the take-up reel disk to prevent tape slackening when the unit is stopped in fast forward or rewind mode.		

(BOTTOM VIEW)



No.	Function	No.	Function
1.	Slow brake lever Gets in contact with the capstan D.D. motor linking to the master cam in the slow still mode, and brakes it to a certain degree.	6.	Limiter pulley ass'y Transmits the power of the capstan D.D. motor to the reel disk via the drive idler.
3.	Capstan D.D. motor A motive power which runs the tape. It transmits the power via the Drive belt.	8.	Shifter Transmits the operation of the master cam to break ass'y. loading gear, tension arm and clutch lever.
4.	Drive belt Transmits the power to run the tape to the Limiter pulley.	9.	Take-up Loading gear Shifts the take-up pole base and guide roller via the loading gear T, and applies the tape around the drum assembly, as well as transmits the power to the loading gears.

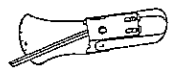
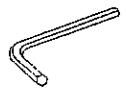
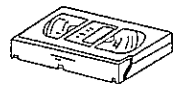
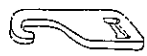
4. ADJUSTMENT, REPLACEMENT AND ASSEMBLY OF MECHANICAL UNITS

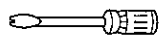
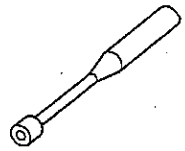
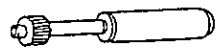
Here we will describe a relatively simple service work in the field, not referring to the more complicated repairs which would require the use of special equipment and tools (drum assembly replacement, for example).

We are sure that the easy-to-handle tools listed below would be more than handy for periodical maintenance to keep the machine in its original working condition.

TOOLS NECESSARY FOR ADJUSTING THE MECHANICAL UNITS

The following tools are required for proper service and satisfactory repair.

<table>
<tr><th>No.</th><th>Jig Item</th><th>Part No.</th><th>Code</th><th>Configuration</th><th>Remarks</th></tr>
<tr><td>1</td><td>Reel Disk Height Adjusting Jig</td><td>JiGRH0002</td><td>BR</td><td> </td><td rowspan="2">These Jigs are used for checking and adjusting the reel disk height.</td></tr>
<tr><td>2</td><td>Master Plane Jig</td><td>JiGMP0001</td><td>BY</td><td> </td></tr>
<tr><td rowspan="2">4</td><td>Torque Gauge (90g)</td><td>JiGTG0090</td><td>CM</td><td rowspan="2"> </td><td rowspan="3">These Jigs are used for checking and adjusting the torque of take-up and supply reel disks.</td></tr>
<tr><td>Torque Gauge (1.2kg)</td><td>JiGTG1200</td><td>CN</td></tr>
<tr><td>5</td><td>Gauge Head</td><td>JiGTH0006</td><td>AW</td><td> </td></tr>
<tr><td>6</td><td>Cassette Torque Meter</td><td>JiGVHT-063</td><td>CZ</td><td> </td><td>This cassette torque meter is used for checking and adjusting the torque of take-up for measuring tape back tension.</td></tr>
<tr><td rowspan="2">7</td><td>Tension Gauge (300g)</td><td>JiGCG0300</td><td>BF</td><td rowspan="2">  </td><td rowspan="2">There are two gauges used for the tension measurements, 300 g and 2.0kg.</td></tr>
<tr><td>Tension Gauge (2.0kg)</td><td>JiGSG2000</td><td>BS</td></tr>
<tr><td rowspan="2">8</td><td>Hex Wrench (0.9mm)</td><td>JiGHW0009</td><td>AE</td><td rowspan="2">  </td><td rowspan="2">These Jigs are used for loosening or tightening special hexagon type screws.</td></tr>
<tr><td>Hex Wrench (1.5mm)</td><td>JiGHW0015</td><td>AE</td></tr>
<tr><td>9</td><td>Alignment Tape (PAL)</td><td>VROCPSV</td><td>CK</td><td>  </td><td>These tapes are especially used for electrical fine adjustment.
<table>
<tr><th>Video</th><th>Audio</th><th>HiFi Audio</th><th>Track</th></tr>
<tr><td>625 Monoscope</td><td>6k</td><td>-</td><td>49µm</td></tr>
<tr><td>PAL Colour Bar</td><td>1k</td><td>-</td><td>49µm</td></tr>
</table></td></tr>
<tr><td>11</td><td>Tension Gauge Adapter</td><td>JiGADP003</td><td>BK</td><td>  </td><td>This Jig is used with the tension gauge. Rotary transformer clearance adjusting jig.</td></tr>
</table>

No.	Jig Item	Part No.	Code	Configuration	Remarks
12	Special Bladed Screwdriver	JiGDRiVERH-4	AP		This screwdriver is used for adjusting the guide roller height.
14	Torque Driver	JiGTD1200	CB		This is used to screw down resinmade parts: the specified torque is 5kg.
15	M3 type 5.5 mm square box driver for reverse guide	JiGDRiVER11055	AR		This Jig is used for height adjustment of the reverse guide (for reverse guide height adjustment).
17	Reverse Guide Height Adjusting Jig	JiGRVGH-F18	BU		This Jig is used for height adjustment of the reverse guide.
18	Gear Driver	JiGDRiVER-6	BM		For X value adjustment

MECHANICAL PARTS REQUIRING PERIODICAL INSPECTION

Use the following table as a guide to maintain the mechanical parts in good operating condition.

Parts \ Maintained	500 hrs.	1000 hrs.	1500 hrs.	2000 hrs.	Possible symptom encountered	Remarks
Guide roller ass'y	□	□	□	○	Lateral noises Head occasionally blocked	Abnormal rotation or significant vibration requires replacement.
Sup Guide Shaft	□	□	□	□		Clean tape contact part with the specified cleaning liquid.
Retaining guide	□	□	□	□		
Slant pole	□	□	□	○		
Upper and lower drum ass'y	□	○□	○□	○□	Poor S/N ratio, no colour Poor flatness of the envelope with alignment tape	Clean tape contact area with the specified cleaning liquid.
Full-erase head	□	□	□	○	Poor colour, beating	
A/C head	□	□	□	○	Low or distorted audio	
Capstan D.D. Motor	□	□	□	○	No tape running, uneven colour	
Pinch roller	□	□	□	○	No tape running, tape slack	Clean rubber and rubber contact area with the specified cleaning liquid.
Drive belt		□		○	No tape running, tape slack, no fast forward/rewind motion	
Tension band ass'y				○	Cassette not loaded or unloaded	
Loading Motor				○		
Idler Wheel ass'y				○	No tape running	
Limiter pulley ass'y		□△		○		
Supply/take-up Main brake levers				○	Tape slack	
AHC (Automatic Head Cleaner)		○		○		Replace the roller of the cleaner when it wears down. Just change the AHC roller assembly for new one.

NOTE: ○ : Part replacement.
□ : Cleaning (For cleaning, use a lint-free cloth dampened with pure isopropyl alcohol).
△ : Oil refilling (The indicated point should be lubricated with high quality spindle oil every 1000hrs).

If the reading is out of the specified value, clean or replace the part.

REMOVAL AND REASSEMBLY OF CASSETTE HOUSING CONTROL ASSEMBLY

• **Removal**

1. Set the cassette ejected condition in the cassette eject mode.
2. Unplug the recorder from the main source.
3. Follow the procedures below in the specified order.
   a) Remove the cassette housing installation screws ①.
   b) Slide and pull out the cassette housing control assembly upward.

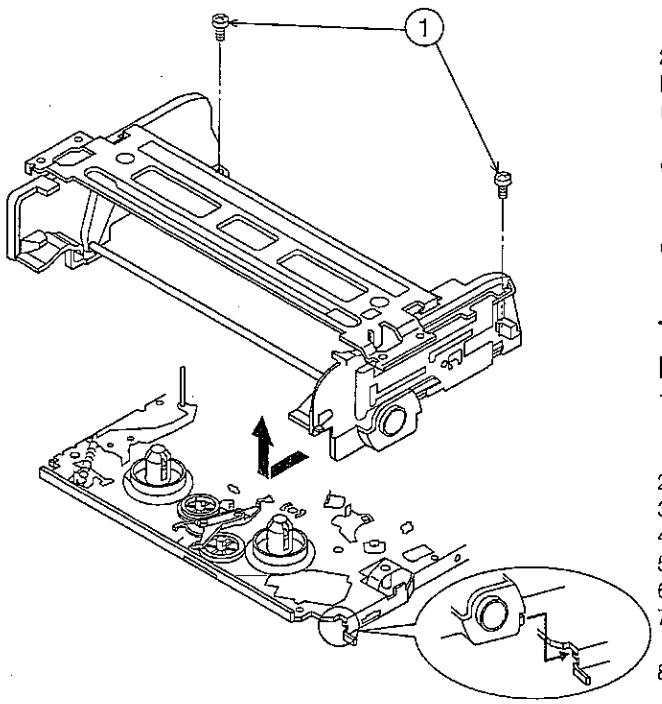


Figure 4-1.

• **Reassembly**

1. Before installation of the cassette housing control assembly, make a short-circuit between TP5005 and TP5006, both located at the left on your side on the main PWB. Plug in the power cord. The cassette control drive gear starts and stops just when the big face gear shows in the mechanism chassis window. Engage the tooth 2 of the casecon drive gear with the tooth 3 of the cassette control drive angle as shown in Fig. 4-2, to position the cassette control on the mechanism chassis.

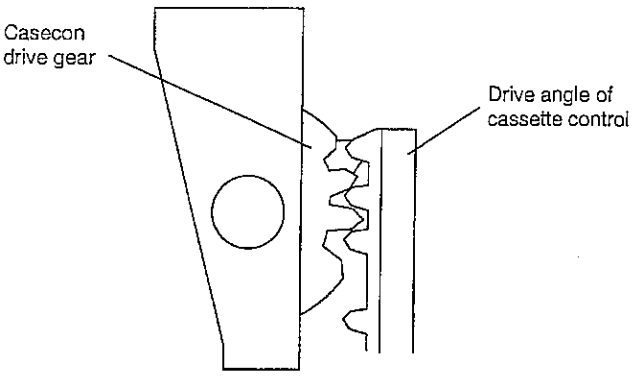


Figure 4-2.

2. Follow the procedures for removal in the reverse order.

Notes:

① In using a magnet screw driver, be sure to keep it away from the A/C head, FE (Full Erase) head, and the drum.
② In removal and reassembly, take care not to hit the cassette housing control assembly and tools against the guide pin, drum, or the like there about.
③ Load the cassette once onto the cassette housing control assembly after reassembly.

TO RUN A TAPE WITHOUT THE CASSETTE HOUSING CONTROL ASSEMBLY

1. Be sure to make a short-circuit between TP5005 and TP5006, both located at the left on your side on the main PWB before turning on the power.
2. Plug in the power cord.
3. Turn on the power switch.
4. Open the lid of a cassette tape by hand.
5. Hold the lid with two pieces of vinyl tape.
6. Set the cassette tape in the mechanism shassis.
7. Stabilize the cassette tape with a weight (500g) to prevent floating.
8. Perform running test.

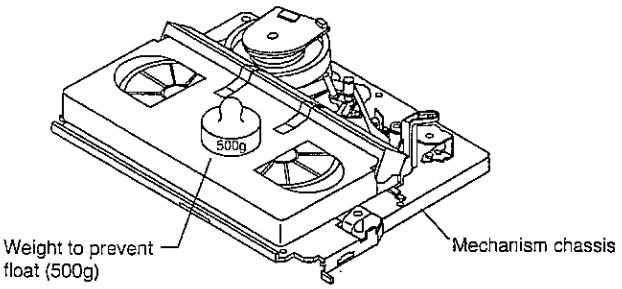


Figure 4-3.

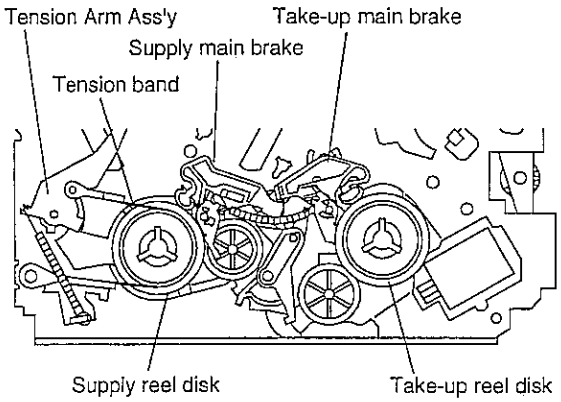
Note:
The weight should not be more than 500g.

REPLACEMENT AND HEIGHT CHECKING AND ADJUSTMENT OF REEL DISKS

- **Removal (Supply and Take-up reel disks)**

1. Remove the cassette housing control assembly.
2. Pull the tension band out of the tension arm.
3. Release the supply/take-up auxiliary brake lever by hand, which makes unnecessary removal of the supply main brake and the take-up main brake.
4. Open the hook at the top of the reel disk, and remove the reel disk.

<In the EJECT or UL STOP mode>



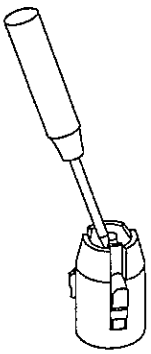


Figure 4-4.

Note:
When the tension band is pressed in the direction of the arrow for removal, the catch is hard to be deformed.

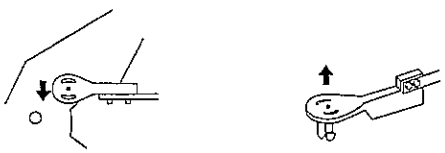


Figure 4-5.

- **Reassembly (Supply reel disk)**

1. Clean the reel disk shaft and apply oil to it.
2. Align the phase of the reel disk to that of the reel relay gear, and install a new supply reel disk onto the shaft.
3. Replace the tension band around the supply reel disk, and insert it into the hole of the tension arm with the supply auxiliary brake lever released.
4. Check the reel disk height.

Notes:
① Take enough care not to deform the tension band during installation of the supply reel disk.
② Be careful not to damage the supply main brake and the reel relay gear.

- **Reassembly (Take-up reel disk)**

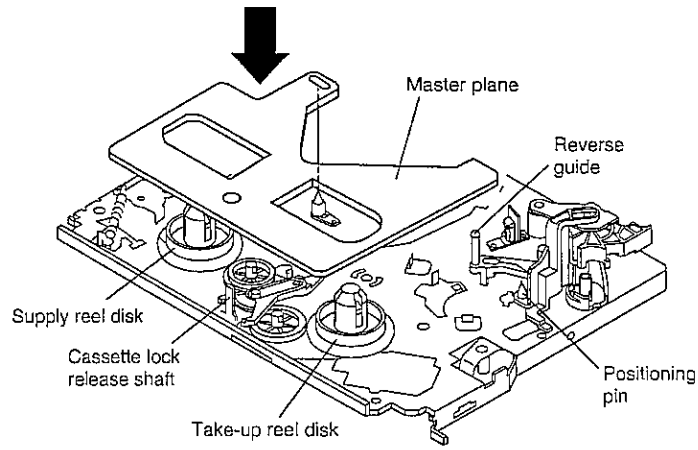
1. Clean the reel disk shaft and apply oil to it.
2. Release the take-up auxiliary brake lever to align the phase of the reel disk to that of the reel relay gear and to install a new take-up reel disk onto the shaft.
3. Check the reel disk height and reassemble the take-up main brake.

Note:
Take care not to damage the take-up main brake.

* After reassembly, check the video search rewind back tension (see page 16), and check the brake torque (see page 18).

- **Height checking and adjustment**

Note:
Place the master plane onto the mechanism unit, taking care not to hit the drum (see Figure 4-6).



Set the master plane releasing the reverse guide by a finger.

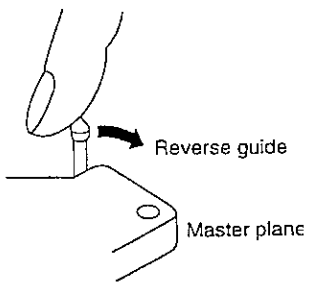


Figure 4-6.

- Check that the reel disk is lower than part A but higher than part B. If the height is not correct, readjust the reel disk height by changing the poly-slider washer under the reel disk.

Note:
Whenever replacing the reel disk, perform the height checking

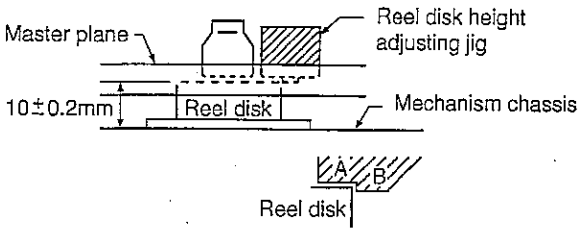


Figure 4-7.

and adjustment.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN FAST FORWARD MODE

- **Remove the cassette housing control assembly.**
- **Make a short-circuit between TP5005 and TP5006, both located at the left on your side on the main PWB. Now turn on the power.**
- **Setting**

1. Set a torque gauge to zero on the scale. Place it on the take-up reel disk.
2. Press the FF button to set the mechanism to the fast forward mode.
3. To calculate the remaining capacity of the play back mode, slowly rotate the supply reel disk, and then shift it into the forward mode.

- **Checking**

1. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction.
2. Check to see if the take-up torque is higher than 69 mN-m (700 gf-cm).

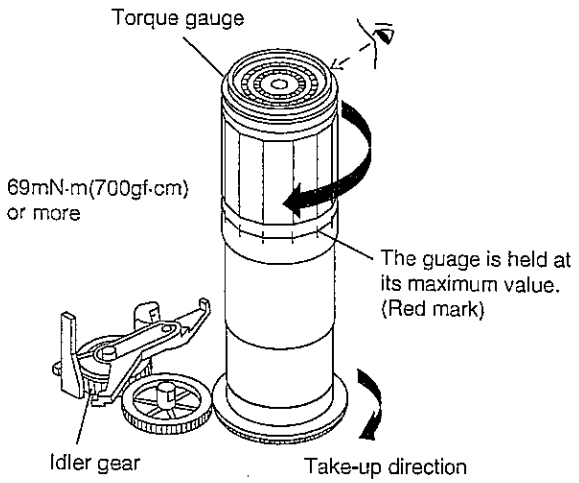


Figure 4-8.

- **Adjustment**

1. If the take-up torque is outside the range, clean the capstan D.D. motor pulley, drive belt and limiter pulley with cleaning liquid, then recheck the torque.
2. If the take-up torque is still out of range, replace the drive belt.

Notes:
1. Hold down the torque gauge so that it may not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN REWIND MODE

- **Remove the cassette housing control assembly.**
- **Make a short-circuit between TP5005 and TP5006, both located at the left on your side on the main PWB. Now turn on the power.**
- **Setting**

1. Set a torque gauge to zero on the scale. Place it on the supply reel disk.
2. Press the REW button to set the mechanism to the rewind mode.
3. To calculate the remaining capacity, slowly rotate the take-up reel disk, and then shift it into the rewind mode.

- **Checking**

1. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction.
2. Check to see if the take-up torque is higher than 69 mN-m (700 gf-cm).

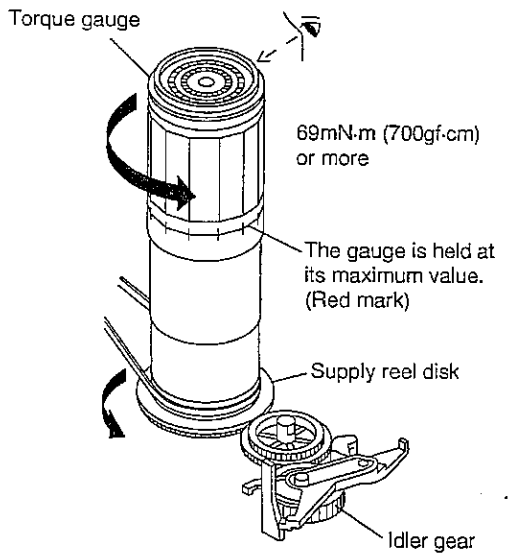


Figure 4-9.

- Adjustment

1. If the take-up torque is outside the range, clean the capstan D.D. motor pulley, drive belt and limiter pulley with cleaning liquid, then recheck the torque.
2. If the take-up torque is still out of range, replace the drive belt.

Notes:

1. Hold down the torque gauge so that it may not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN PLAYBACK MODE

1. Remove the cassette housing control assembly.
2. Make a short-circuit between TP5005 and TP5006, both located at the left on your side on the main PWB. Now turn on the power.
3. Open the lid of the cassette torque meter, and hold it with two pieces of vinyl tapes.
4. Load the cassette torque meter into the unit.
5. Put the weight (500g) on the cassette torque meter.
6. Press the REC button to put the unit in REC mode.

Set value LP 10.5 ± 3.8mN·m (107 ± 39gf·cm)
* SP only model 12 ± 3.8mN·m (122 ± 39gf·cm)

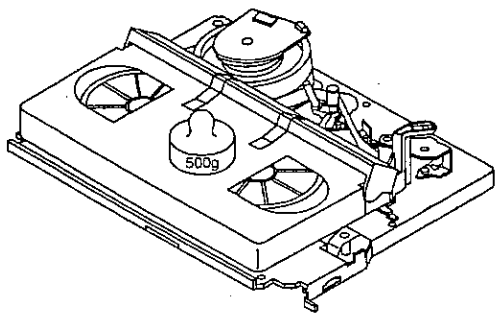


Figure 4-10.

- Checking

1. Check that the torque is in the range of 10.5 ± 3.8mN·m (107 ± 39gf·cm).
2. The torque fluctuates due to the rotational deviation of the limiter pulley ass'y. Use the center of the fluctuation as the value.
3. Place the ass'y in the LP record mode, and check that the take-up torque is within the range.

- Adjustment

If the take-up torque in the playback mode is outside the range, replace the limiter pulley ass'y.

Note:

Stabilize the cassette torque meter to prevent floating.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN VIDEO SEARCH REWIND MODE

- **Remove the cassette housing control assembly.**
- **Make a short-circuit between TP5005 and TP5006, both located at the left on your side on the main PWB. Now turn on the power.**

- Setting

1. Push the PLAY button to place the ass'y in the playback mode.
2. Push the REW button to place the ass'y in the video search rewind mode.

- Checking

1. Place the torque gauge on the supply reel disk, and turn it counterclockwise very slowly (one rotation every 1 to 2 seconds) and check that the torque is within the set value 14.0 ± 3.9mN·m (144 ± 40gf·cm).

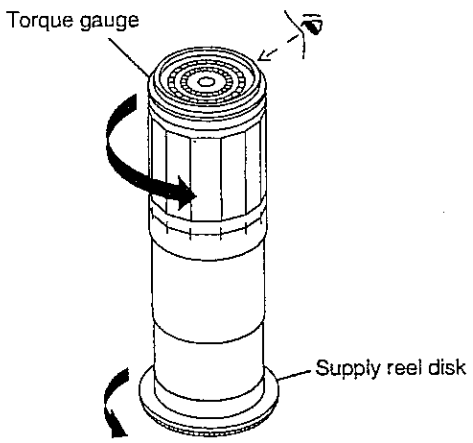


Figure 4-11.

Note:

Set the torque gauge securely on the supply reel disk. If it is not secure, the measurement will be incorrect.

- Adjustment

If the take-up torque in video search rewind mode is outside the range, replace the limiter pulley ass'y.

Note:

The torque fluctuates due to the rotational deviation of the limiter pulley ass'y. Use the center of the fluctuation at the value.

CHECKING THE VIDEO SEARCH REWIND BACK TENSION

- **Remove the cassette housing control assembly.**
- **Make a short-circuit between TP5005 and TP5006, both located at the left on your side on the main PWB. Now turn on the power.**
- **Checking**

1. Push the PLAY button to place the ass'y in the playback mode.
2. Push the rewind button to place the ass'y in the video search rewind mode.
3. Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within the set value 3.0±1mN·m (31±10gf·cm).

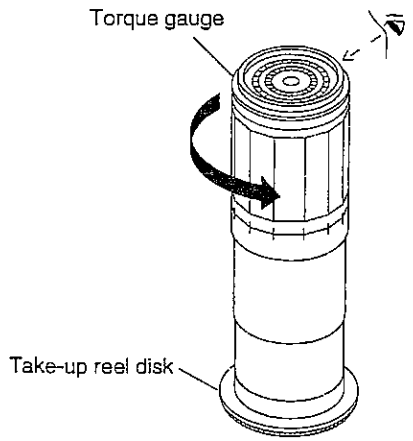


Figure 4-12.

Notes:
① Set the torque gauge securely on the take-up reel disk. If it is not secure, the measurement will be incorrect.
② Measure the torque applying the torque gauge's weight.

CHECKING THE PINCH ROLLER PRESSURE

- **Remove the cassette housing control assembly.**
- **Make a short-circuit between TP5005 and TP5006, both located at the left on your side on the main PWB. Now turn on the power.**
- **Checking**

Push the PLAY button to place the ass'y in the playback mode.

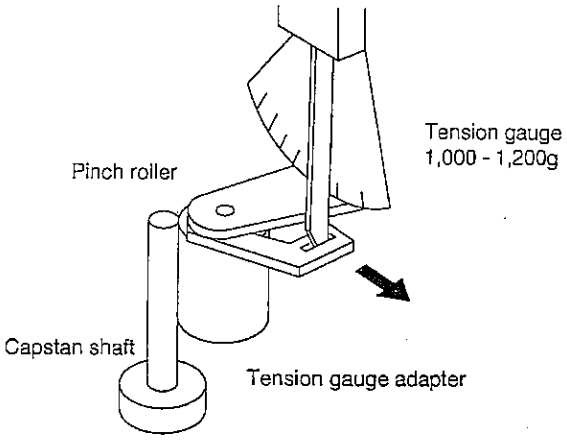


Figure 4-13.

1. Detach the pinch roller from the capstan shaft.
2. Set the tension gauge by hooking the tension gauge adapter onto the pinch roller shaft.
3. Gradually release the pressure to allow the pinch roller to touch the capstan shaft. When the pinch roller just touches the capstan shaft, read the indication on the gauge.
4. Check that the reading of the tension gauge is in the range of 900 to 1200 g.

CHECKING AND ADJUSTMENT OF TENSION POLE POSITION

- **Remove the cassette housing control assembly.**
- **Make a short-circuit between TP5005 and TP5006, both located at the left on your side on the main PWB. Now turn on the power.**
- **Setting**

1. Open the lid of cassette tape (E-180), and hold it with two pieces of vinyl tapes.
2. Load the cassette tape into the unit.
3. Put the weight (500g) on the cassette tape.
4. Make the adjustment with the beginning of a E-180 tape.

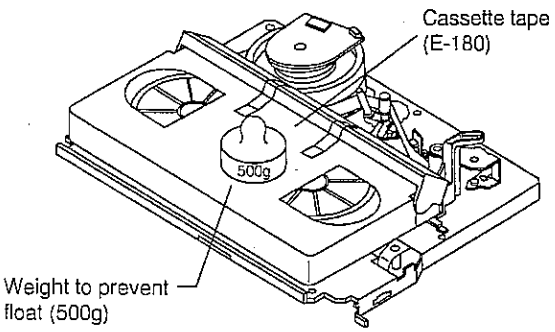


Figure 4-14.

- **Checking**

1. Set a cassette tape, press the REC button and get the tape loaded. Now check the tension pole position.

2. Visually check to see if the center of the tension pole is in alignment with the line 1.3 mm left of the center line of the sup guide shaft. Readjust as required in the following steps.

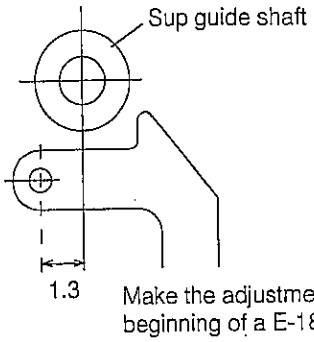


Figure 4-15.

① If the center of tension pole is at the left from the dotted line:

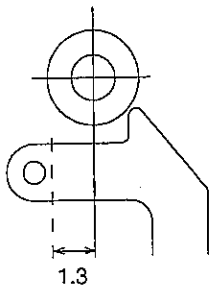


Figure 4-16.

Put a bladed screwdriver into the tension pole ADJUSTER and turn it clockwise.

② If the end is at the right from the dotted line:

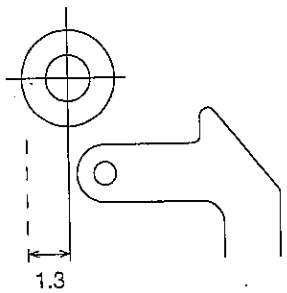


Figure 4-17.

Put a bladed screwdriver into the tension pole adjuster to turn it counter-clockwise.

③ Adjustable range of the tension pole ajuster.

④ Adjustable range of tension pole adjusting cam.

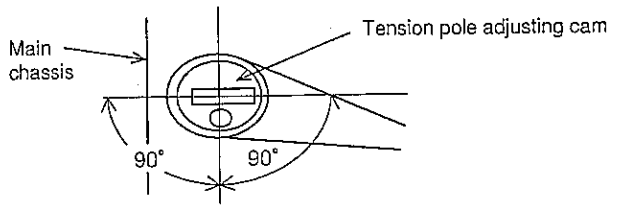


Figure 4-18.

Adjust the tension pole adjuster so that the circle mark on the cam be within 90° left and right.

CHEKING AND ADJUSTMENT OF RECORD/ PLAYBACK BACK TENSION

- **Remove the cassette housing control assembly.**
- **Make a short-circuit between TP5005 and TP5006, both located at the left on your side on the main PWB. Now turn on the power.**
- **Setting**

1. Open the lid of cassette torque meter, and hold it with two pieces of vinyl tapes.
2. Load the cassette torque meter into the unit.
3. Put the weight (500g) on the cassette torque meter.

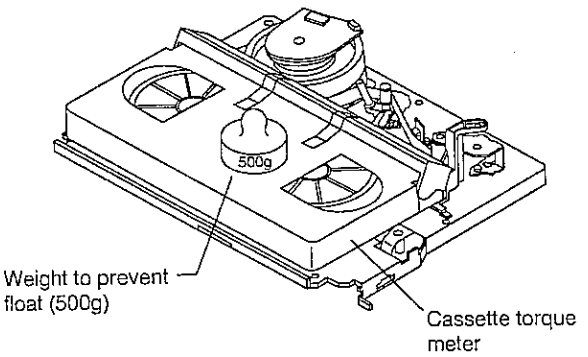


Figure 4-19.

- **Checking**

1. Push the REC button to place the unit in the record mode.
2. Check that the back tension indicated by the gauge is within the set range 31 to 38 g·cm.

Notes:

1. Make sure that the video cassette tape is over the retaining guide.
2. Make sure that the tape is not slack nor damaged at either end.

- **Adjustment**

1. If the reading of the cassette torque meter is less than specified, move the tension spring hook toward A.
2. If the reading of the cassette torque meter is more than specified, move the tension spring hook toward B.

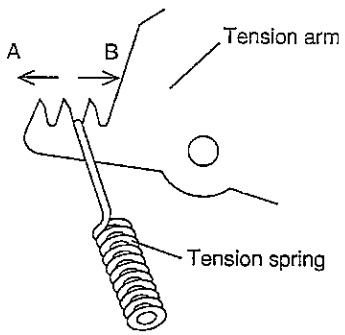
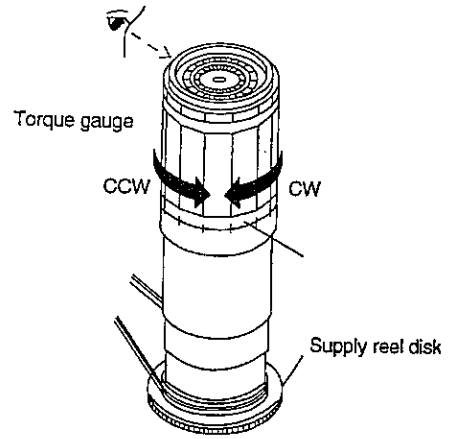


Figure 4-20.

CHECKING THE BRAKE TORQUE

- **Checking the brake torque at the supply side**



CCW:	5.9~9.8mN·m (60~100gf·cm)
CW:	10~32mN·m (100~330gf·cm)

Figure 4-21.

- **Remove the cassette housing control assembly.**

- **Make a short-circuit between TP5005 and TP5006, both located at the left on your side on the main PWB. Now turn on the power.**

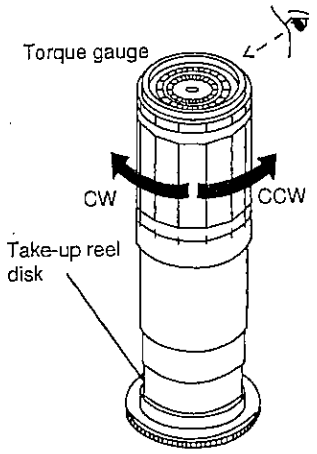
- **Setting**

1. Set a torque gauge to zero on the scale. Place it on the supply reel disk.
2. Switch from the FF mode to the STOP mode.
3. Disconnect the AC power plug.

- **Checking**

1. Rotate the torque gauge (approx. one revolution per 2 seconds) in the clockwise (CW) direction and counterclockwise (CCW) direction of the supply brake so that the reel disk and the indicator of the torque gauge rotate at an equal rate.
   Check that the values are within the range of CW direction = 10 ~32mN·m (100~330gf·cm), CCW direction = 5.9~9.8mN·m (60 ~100gf·cm), and that the brake torque in the CW diretion is at least twice as high as that in the CCW direction.

- Checking the brake torque at the take-up side



CCW:	9.8~34mN·m (100~340gf·cm)
CW:	4~8.3mN·m (40~85gf·cm)

Figure 4-22.

- **Remove the cassette housing control assembly.**

- **Make a short-circuit between TP5005 and TP5006, both located at the left on your side on the main PWB. Now turn on the power.**

- **Setting**

1. Set a torque gauge to zero on the scale. Place it on the take-up reel disk.
2. Switch from the FF mode to the STOP mode.
3. Disconnect the AC power plug.

- **Checking**

1. Rotate the torque gauge (approx. one revolution per 2 seconds) in the clockwise (CW) direction and counterclockwise (CCW) direction of the take-up brake so that the reel disk and the indicator of the torque gauge rotate at an equal rate. Check that the values are within the range of CCW direction= 9.8~34mN·m (100~340gf·cm), CW direction = 4~8.3mN·m (40~85gf·cm), and that the brake torque in the CCW direction is at least twice as high as that in the CW direction.

- **Adjustment of the brake torque at the supply side and the take-up side**

1. If the supply or take-up brake torque is outside the range, clean the supply or take-up reel disk brake lever pad, then recheck the torque.
2. If the supply or take-up brake torque is still outside the range, replace the main brake ass'y.

Note:
When the main brake is replaced, perform the height checking and adjustment of reel disks (see page 13), and the brake torque checking.

REPLACEMENT OF A/C (Audio/Control) HEAD

1. Remove the cassette housing control assembly.
2. Place the unit in the unloading mode, and unplug the power cord.

- **Removal**

1. Remove the screw Ⓐ Ⓑ Ⓒ ① ②.
2. Unsolder the A/C head PWB soldered to the A/C head assembly.

Notes:

1. After replacement, be sure to perform the adjustment of the tape drive train (see page 21). Under any circumstances, avoid touching the head. Clean the head, if touched with your finger, with alcohol.
2. Take care that the springs do not fly off when removing the screws Ⓐ Ⓑ Ⓒ.

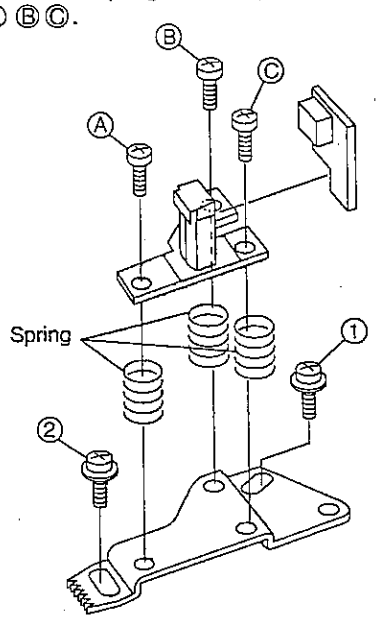
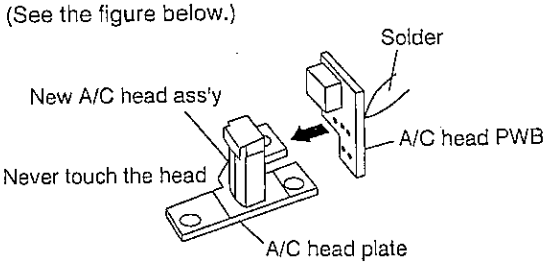


Figure 4-23.

- **Replacement**

1. Solder the removed A/C head PWB onto a new A/C head assembly.
2. Using the slide calipers, set 10.3 mm for the height of the A/C head arm (bottom surface) to the A/C head plate (screw area). (3 places)
(See the figure below.)



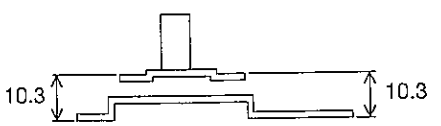


Figure 4-24.

3. Align the left and of the gear of the A/C head arm to the mark on the chassis, and temporarily tighten the screws ① and ② to allow the A/C head arm to smoothly move.
(Reference: Temporary tightening torque: 0.2 N.m as preferable)

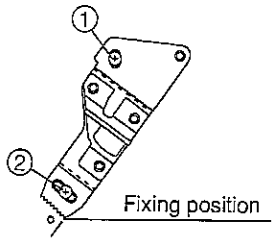
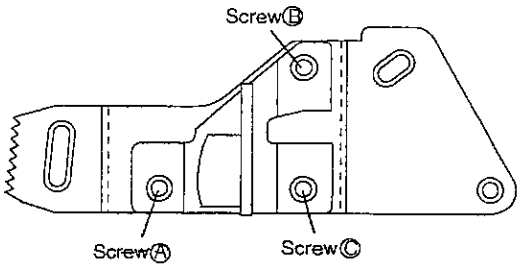


Figure 4-25.

Note:
Take care that he adjustment or height of the A/C head may vary during final tightening if the screws ① or ② is temporarily tightened to be loose.

[A/C head height rough adjustment]

- **Setting**



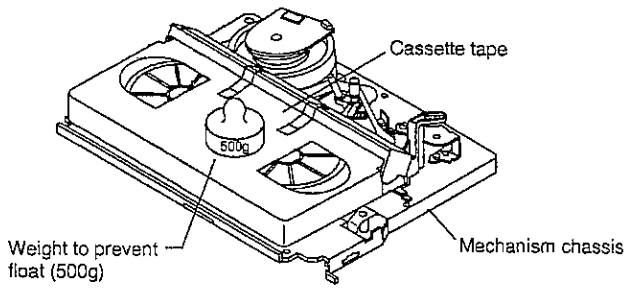


Figure 4-26.

① Set the cassette tape to the mechanism chassis.
② Press the PLAY button to the put the unit in the playback mode.
③ Roughly adjust the height of the A/C head by turning the screw Ⓒ until the tape is in the position shown below.

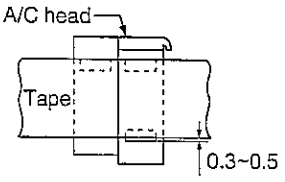


Figure 4-27.

- **Adjustment**

Adjust the screw Ⓒ visually so that the control head is visible 0.3 to 0.5mm below the bottom of the tape.

HEIGHT ADJUSTMENT OF REVERSE GUIDE

[Height adjustment of reverse guide]

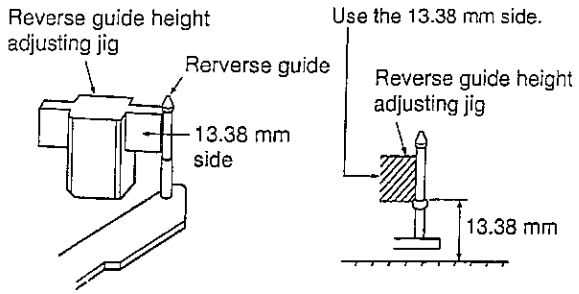


Figure 4-28.

①. Remove open lever (Figure 4-29(a)).
②. In the tape load mode, make adjustment at the 13.38mm side first and then rotate the reverse guide adjuster nut by 1/10 turn counterclockwise.
③. Actually load the unit with a tape, put it in the play mode, and make sure the tape is free from wrinkles near the reverse guide.
④. Use a commercially available box driver to turn the height adjusting nut.

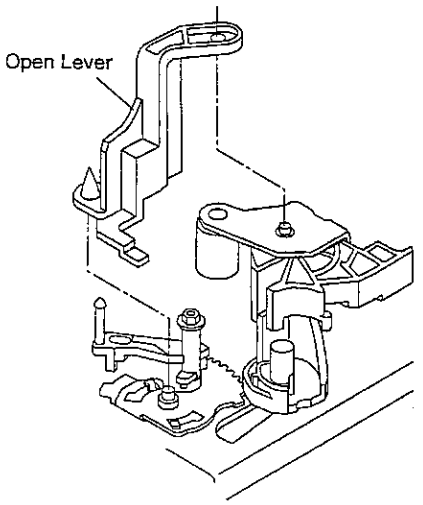


Figure 4-29 (a).

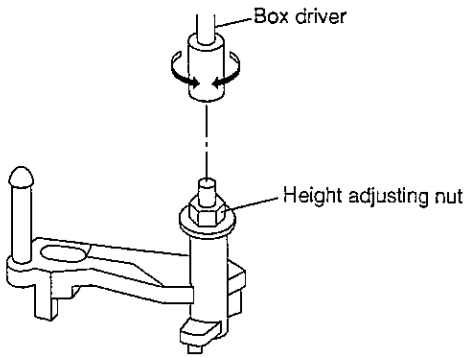


Figure 4-29 (b).

ADJUSTMENT OF TAPE DRIVE TRAIN

1. Remove the cassette housing control assembly.
2. Make a short-circuit between TP5005 and TP5006, both located at the left on your side on the main PWB. Now turn on the power.
3. Check and adjust the position of the tension pole. (See page 16.)
4. Check and adjust the video search rewind back tension. (See page 16.)
5. Set the A/C head. (See page 19.)
6. Rough adjustment of tape drive train.
   a) Connect the oscilloscope to the test point for PB CHROMA envelope output (TP201). Set the synchronism of the oscilloscope to EXT. The PB CHROMA signal is to be triggered by the head switching pulse (TP202).
   b) Loosen the setscrew at the lower part of the guide roller, and adjust it with an adjusting Hexagon Wrench (JIGHW0009) so that the guide roller turns smoothly. (Do not overloosen the setscrew, which causes insecurity of the guide roller.) (See Figure 4-30.)
   c) Set the alignment tape (monoscope pattern) on the reel disk, and place the unit in the playback mode. (Place a 500 g weight on the cassette tape to prevent floating of the cassette tape.)

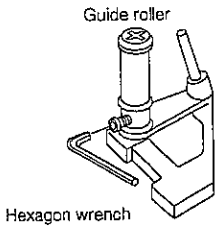


Figure 4-30.

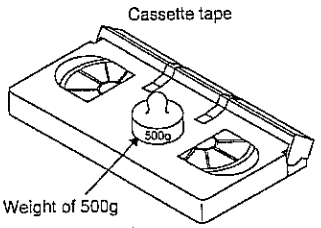


Figure 4-31.

   d) In the X value adjustment mode (see the Electrical Adjustment), change the envelope waveform from MAX to MIN, and MIN to MAX by pushing the (+) or (-) tracking button, and check a flat response is obtained on the waveform.
   e) If a flat response cannot be obtained, roughly adjust the guide rollers on the supply side and take-up side using an adjusting screw driver until a flat response can be obtained.
   f) Tighten the screw Ⓐ to eliminate wrinkles from the tape of the retain guide flange area.
   Replace the tape to check the tape on the retain guide flange area for wrinkles.
   (1) No wrinkle is present.
   Turn the screw Ⓐ clockwise to generate wrinkles on the tape at the flange area, and then back off the screw Ⓐ as far as the wrinkles are just eliminated.
   (2) Wrinkles are present.
   Turn the screw Ⓐ counterclockwise as far as the wrinkles are just eliminated.
   Reference:
   If the screw Ⓐ is turned clockwise, wrinkles will be produced on the lower flange.

Notes:

1. Place the tracking control in the center position, and adjust the X-position so that the PB CHROMA envelope becomes maximum for easier rough adjustment of the tape drive train.
2. In the rough adjustment, pay particular attention to the outlet side.

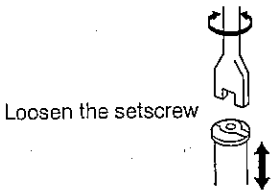


Figure 4-32.

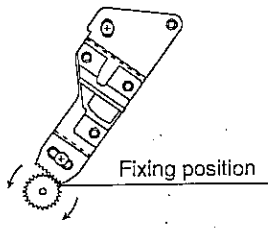


Figure 4-33.

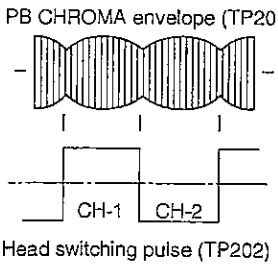


Figure 4-34.

7. Adjustment of A/C head height and azimuth
   a) Connect an oscilloscope to the audio output terminal.
   b) Using the alignment tape with linear audio pre-recorded signal of 1 kHz, adjust the screws Ⓑ and Ⓒ to maximize the audio output, and adjust the screw Ⓐ to eliminate wrinkles from the tape at the retain guide flange. (Refer to P21-6-f.)
   Repeatedly adjust the screws Ⓑ, Ⓒ and Ⓐ in this sequence until the audio output becomes the maximum. (1 to 3 times as ordinary)
   c) Using the alignment tape which records a linear audio signal of 7 kHz, finally adjust the screw Ⓑ until the audio output becomes the maximum.

8. Adjustment of tape drive train and X-Position
   (Use the alignment tape VROCPSV.)
   a) Connect the oscilloscope to the test points (TP201) for PB CHROMA envelope output. Set the synchronism of the oscilloscope to EXT.
   The PB CHROMA signal is to be triggered by the head switching pulse (TP202).
   b) Play back the tape drive train alignment tape.
   c) Push the (+) or (-) button to change the envelope waveform from MAX to MIN, and MIN to MAX.
   Adjust the guide roller's height on the supply and take-up sides with an adjusting screw driver, to obtain an envelope waveform that is as flat as possible.
   d) If the tape is above or below the helical lead, the PB CHROMA waveform will take the shape shown in Figure 4-35.
   e) Adjust for maximum flatness of the envelope as the step 6, e) in page 21.
   f) Push the (+) or (-) tracking button to check that a flat response is obtained on the envelope waveform.
   g) Secure the guide roller by tightening the guide roller setscrew in the unloading mode.
   h) Play back the tape drive train alignment tape to check that the envelope waveform does not change.

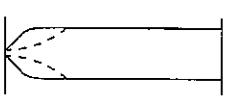
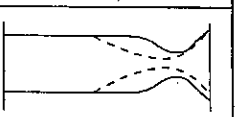
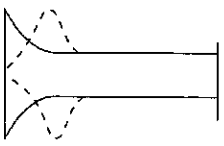
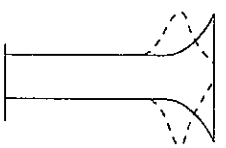
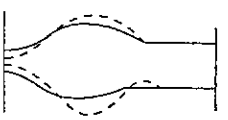
	When the tape is above the helical lead.		When the tape is below the helical lead.	
	Supply side	Take-up side	Supply side	Take-up side
				
				
Adjustment	Supply side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Take-up side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Supply side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The supply side guide roller is then rotated in the clockwise direction to flatten the envelope.	Take-up side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The take-up side guide roller is then rotated in the clockwise direction to flatten the envelope.

Figure 4-35.

a) In the X value adjustment mode (see the Electrical Adjustment), make a short-circuit between TP5005 and TP5006, both located at the left on your side on the main PWB, to center the tracking.
b) Move the A/C head arm with an adjusting gear driver, and adjust the A/C head position for maximum head switching pulse hi side envelope.
Finally tighten the screws ① and ②. (First tighten the screw ①, and next the screw ②.) (Figure 4-36①②)
(Reference: Final tightening torque: 0.6 N.m as preferable.)
c) Adjust the playback switching point.
d) Check the flatness of the envelope waveform and sound by playing back a recorded tape.

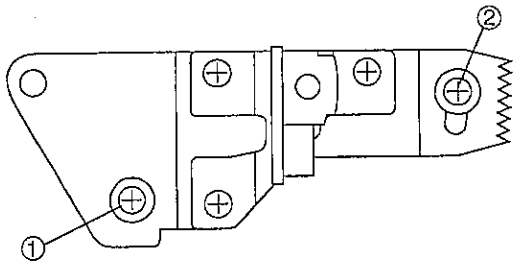


Figure 4-36.

REPLACEMENT OF THE CAPSTAN D.D. (DIRECT DRIVE) MOTOR

- **Remove the cassette housing control assembly.**

- **Removal (Follow the order of indicated numbers.)**

1. Disconnect from the board-to-board connector on the main PWB.
2. Remove the drive belt ①.
3. Remove the screws ②.

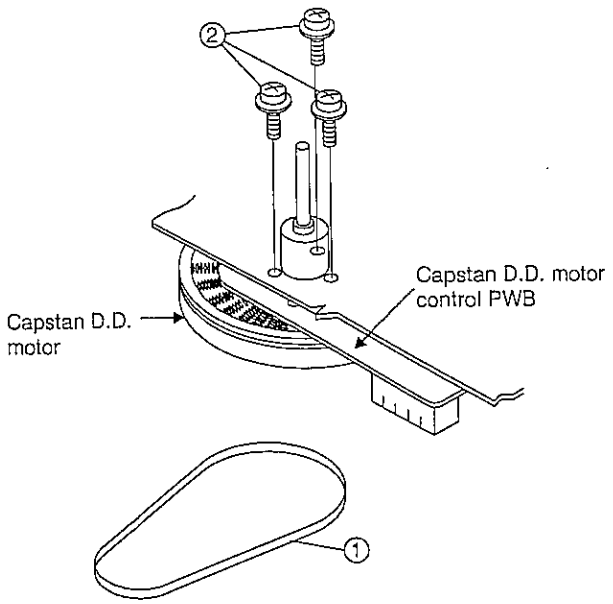


Figure 4-37.

- **Reassembly**

1. Mount the capstan motor on the mechanism chassis making sure not to allow the capstan shaft to hit the mechanism chassis, and attach it with the three screws.
2. Attach the reel belt. Reconnect to the board-to board connector on the main PWB.

Notes:

1. After installing the capstan D.D. motor, be sure to rotate the capstan D.D. motor and chack the movement.
2. Check the servo circuit.

REPLACEMENT OF DRUM D.D. MOTOR

1. Put the unit in the cassette eject position.
2. Unplug the power cord.

- **Removal (Reverse the order in reassembly.)**

1. Disconnect the FFC cable ①.
2. Unscrew the D.D. stator assembly fixing screws ②.
3. Take out the D.D. stator assembly ③.
4. Unscrew the D.D. rotor assembly fixing screws ④.
5. Take out the D.D. rotor assembly ⑤.

Notes:

1. In removing the D.D. stator assembly, part of the drum earth spring pops out of the pre-load collar.
Be careful not to lose it.
2. Secure the D.D. rotor assembly so that the installation positioning holes in the D.D. rotor assembly and upper drum assembly match.
(Match the upper drum's notch with the rotor's hole.)
3. Be careful not to damage the upper drum or the video head.
4. Be sure that the hall device and the D.D. stator assembly are not damaged by the D.D. rotor assembly or other parts.
5. After installation, adjust the playback switching point.

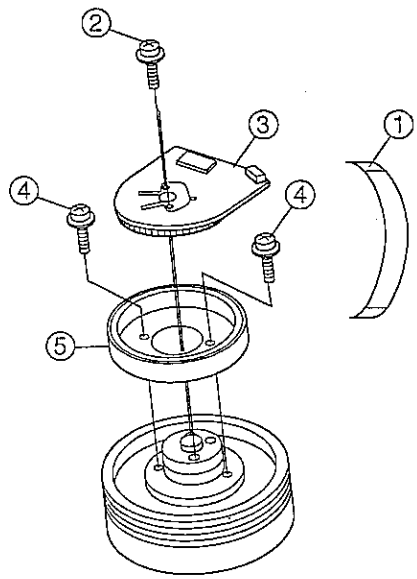


Figure 4-38.

ASSEMBLE THE MECHANISM'S PARTS REQUIRING THE PHASE MATCHING IN THE STEPS BELOW.

1. Assembling the pinch roller assembly, reverse guide assembly and the pinch drive cam (on the front of the mechanism chassis).
2. Mounting the shifter (on the back of the mechanism chassis).
3. Mounting the master cam (on the back of the mechanism chassis).
4. Mounting the connection gear, slow brake and loading motor assemblies (on the back of the mechanism chassis).

1. Assembling the pinch roller assembly, reverse guide assembly and the pinch drive cam (on the front of the mechanism chassis).

Place the following parts in position in numerical order.
(1) Reverse drive lever ①
(2) Reverse guide spring ②
(3) Reverse guide lever ass'y ③
(4) R/G adjusting nut ④
(5) Pinch drive cam ⑤
(6) Pinch roller ass'y ⑥
(7) Open lever ⑦

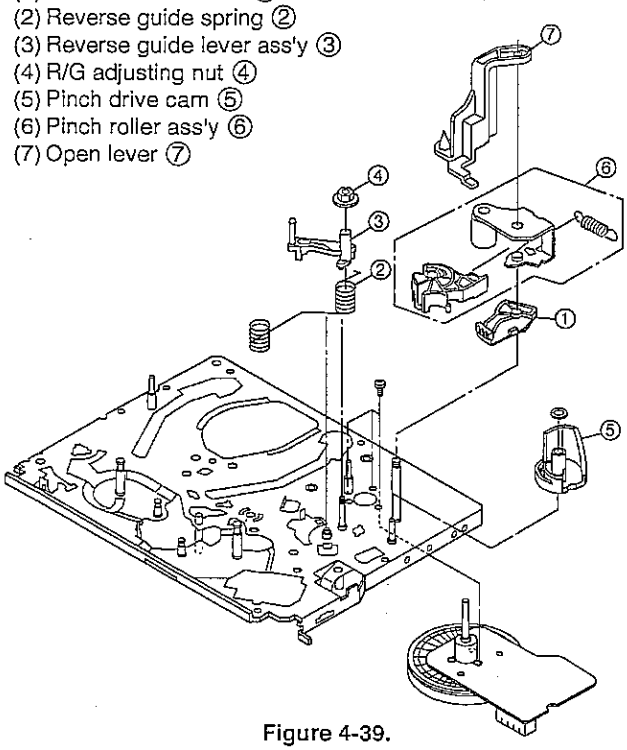
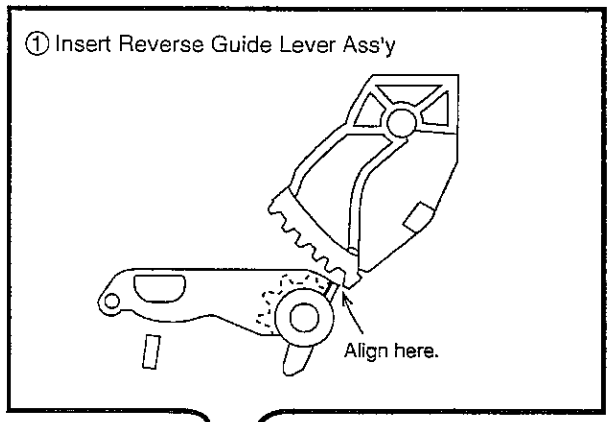


Figure 4-39.



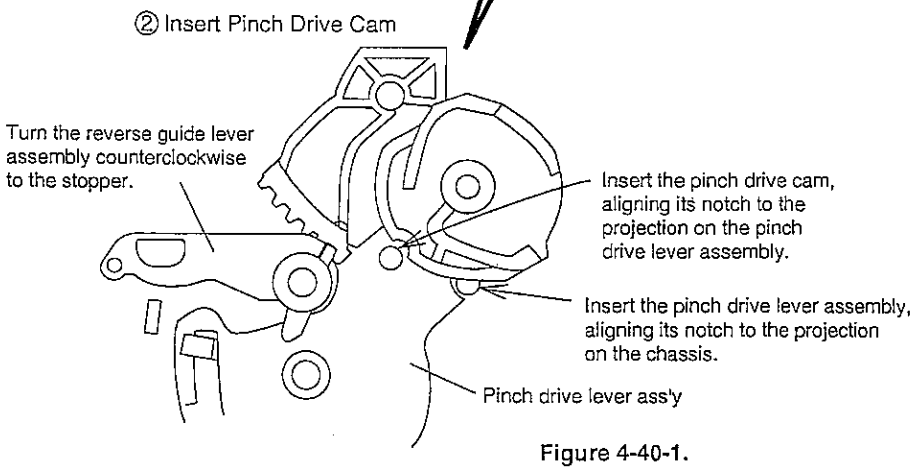

② Insert Pinch Drive Cam
Turn the reverse guide lever assembly counterclockwise to the stopper.
Insert the pinch drive cam, aligning its notch to the projection on the pinch drive lever assembly.
Insert the pinch drive lever assembly, aligning its notch to the projection on the chassis.
Pinch drive lever ass'y

Figure 4-40-1.

③ Insert Pinch Roller/Pinch Double Action Lever Ass'y.

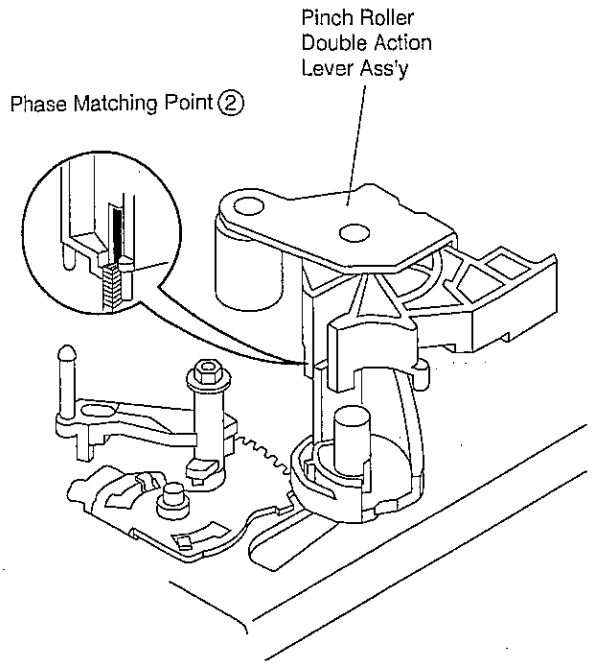


Figure 4-40-2.

④ Insert Open Lever.

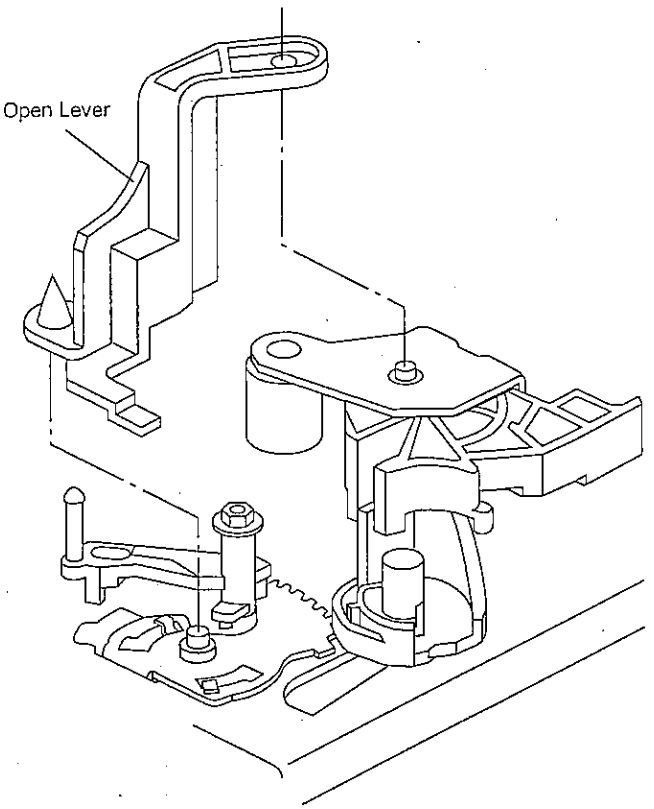


Figure 4-40-3.

2. Mounting the shifter (on the back of the mechanism chassis).

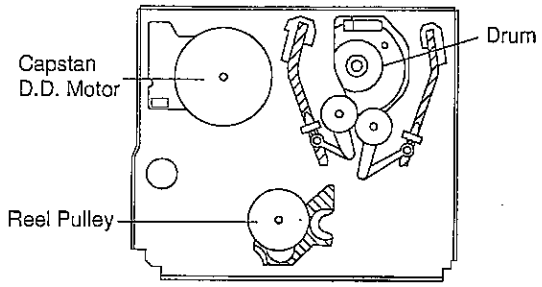


Figure 4-41.

1. Make sure that the loading gear is at the point ① as shown below.
2. Place the shifter in position, keeping in mind the 6 insertion points and the three relief points.
3. For the phase matching at the insertion point ①, see the point ② as shown below.
4. Finally fix the shifter with two washers located on insert points ① and ④.

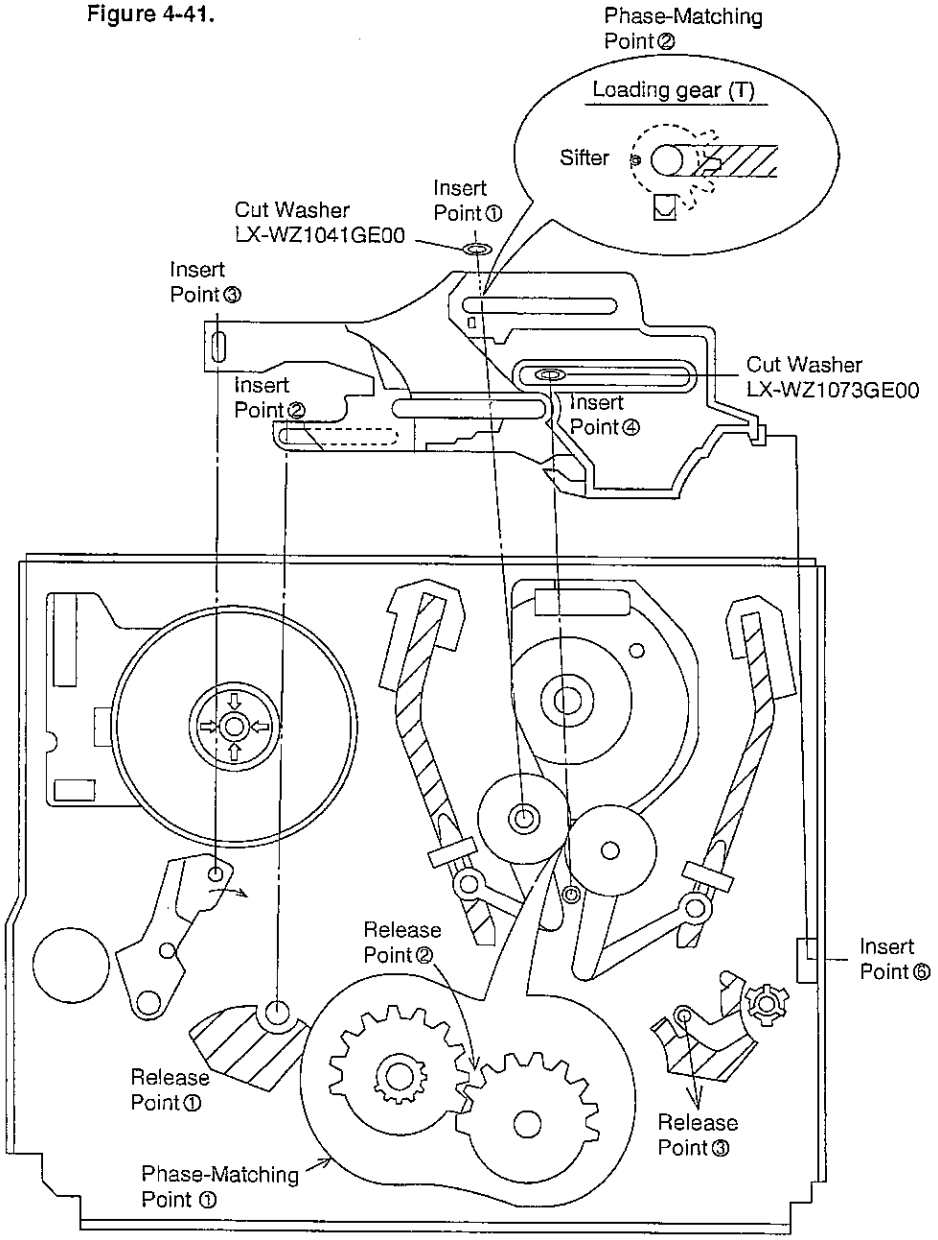


Figure 4-42.

3. Mounting the master cam (on the back of the mechanism chassis).

(1) Make sure beforehand that the shifter is at the point as shown below.
(2) Place the master cam in the position as shown below.

Note:
See the figure below for the phase matching between the master cam and the cassette control drive gear.
(3) Finally fix the master cam with E ring.

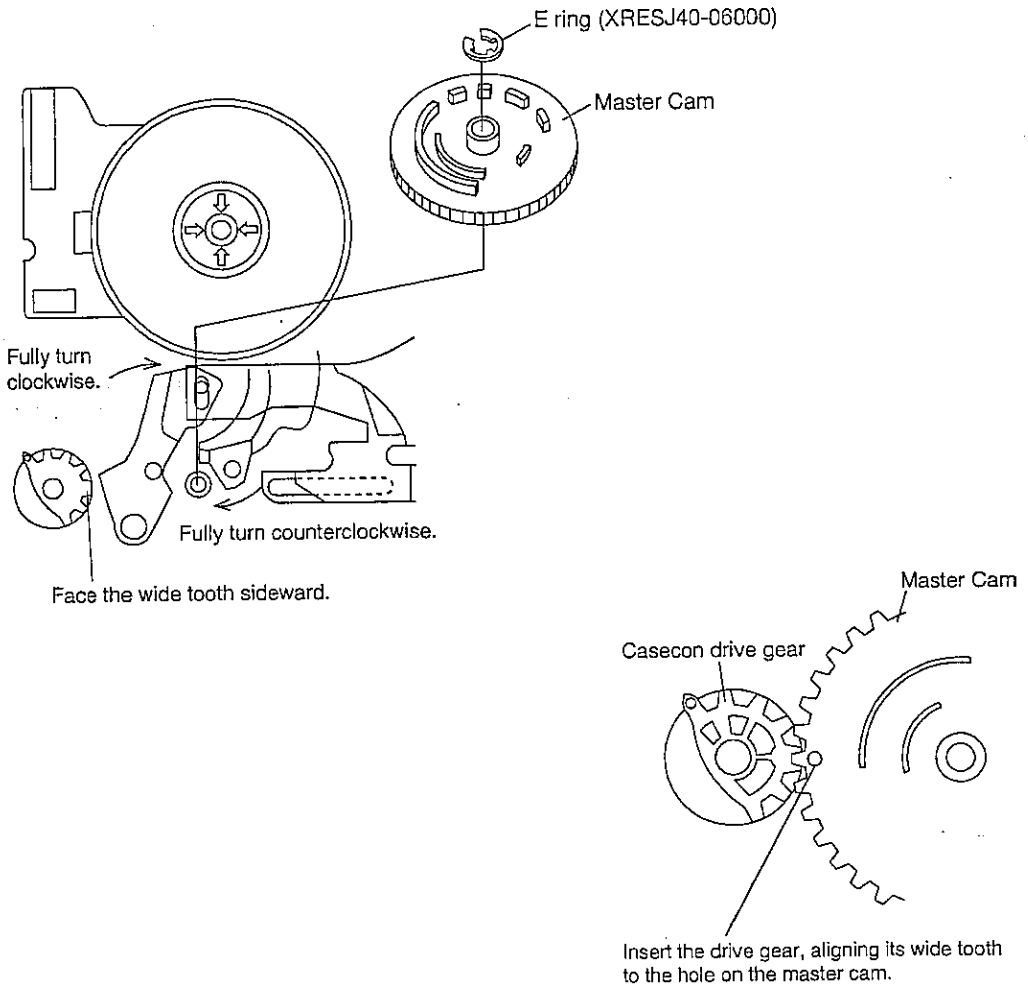

E ring (XRESJ40-06000)
Master Cam
Fully turn clockwise.
Fully turn counterclockwise.
Face the wide tooth sideward.
Master Cam
Casecon drive gear
Insert the drive gear, aligning its wide tooth to the hole on the master cam.

Figure 4-43.

REPLACEMENT OF LOADING MOTOR

- Removal

Remove 2 screws.

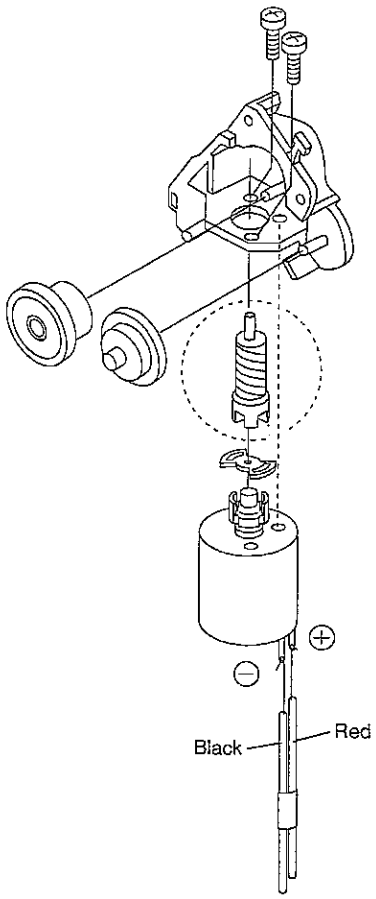


Figure 4-44.

- Replacement

① Take out the old loading motor. Place a replacement loading motor as shown above (Figure 4-44.).

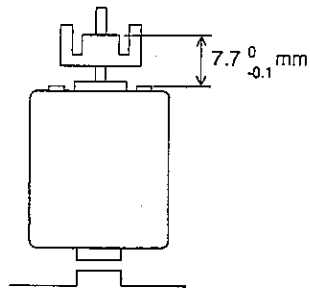


Figure 4-45.

Press-fit the loading motor pulley with a force of less than 98N (10 kgf). Be sure that the pulley is $7.7\ ^{0}_{-0.1}$ mm away from the motor.

ASSEMBLY OF CASSETTE HOUSING

① Framer ass'y

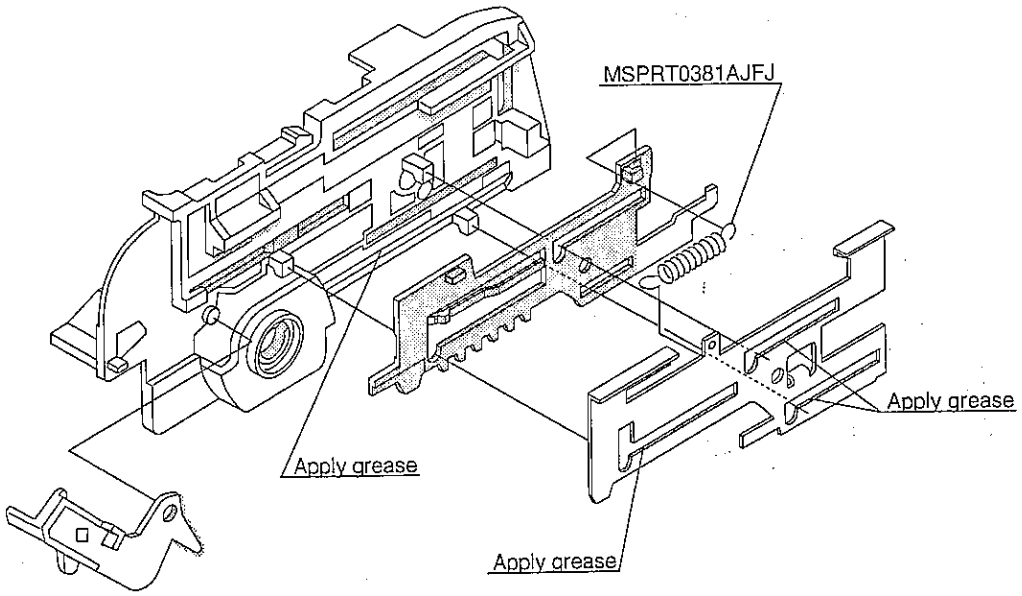


Figure 4-46.

② Synchro Gear, Drive Gear L and Drive Gear R

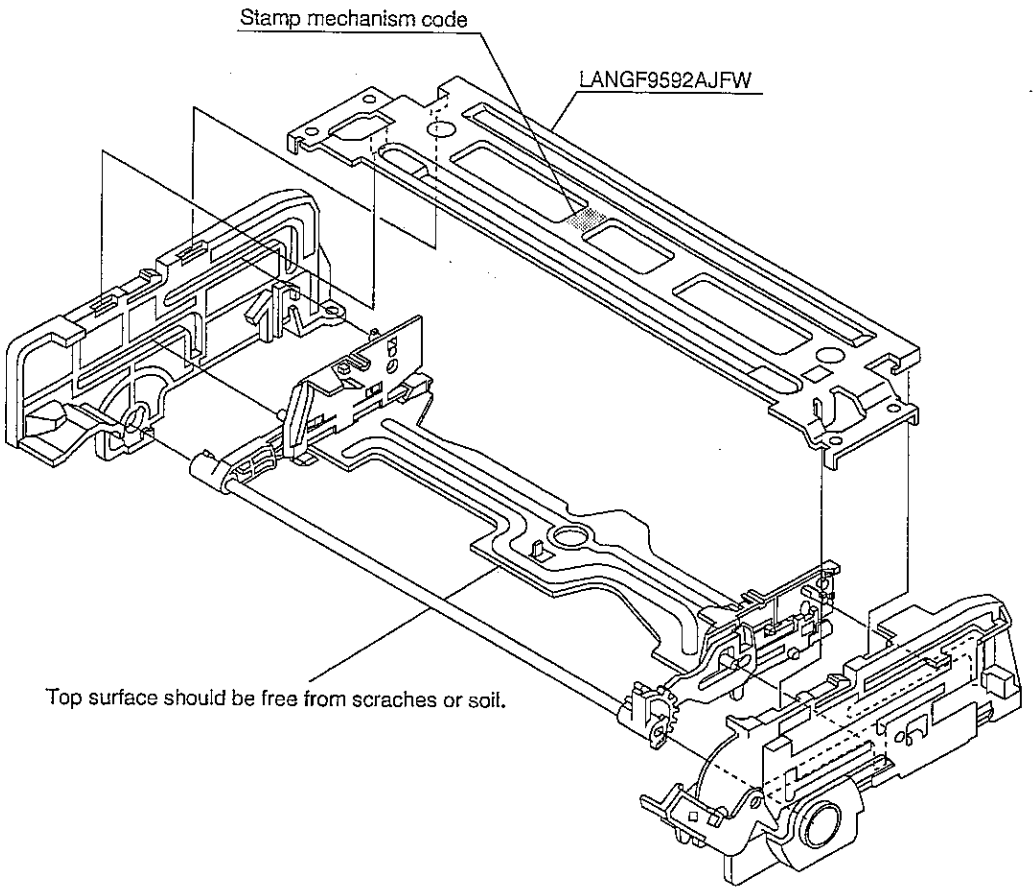


Figure 4-47.

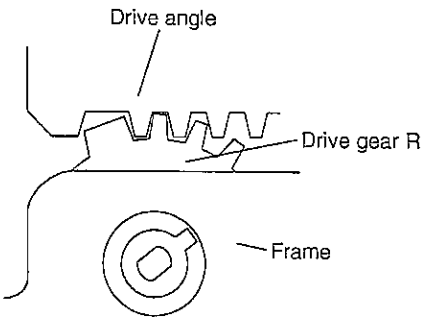


Figure 4-48.

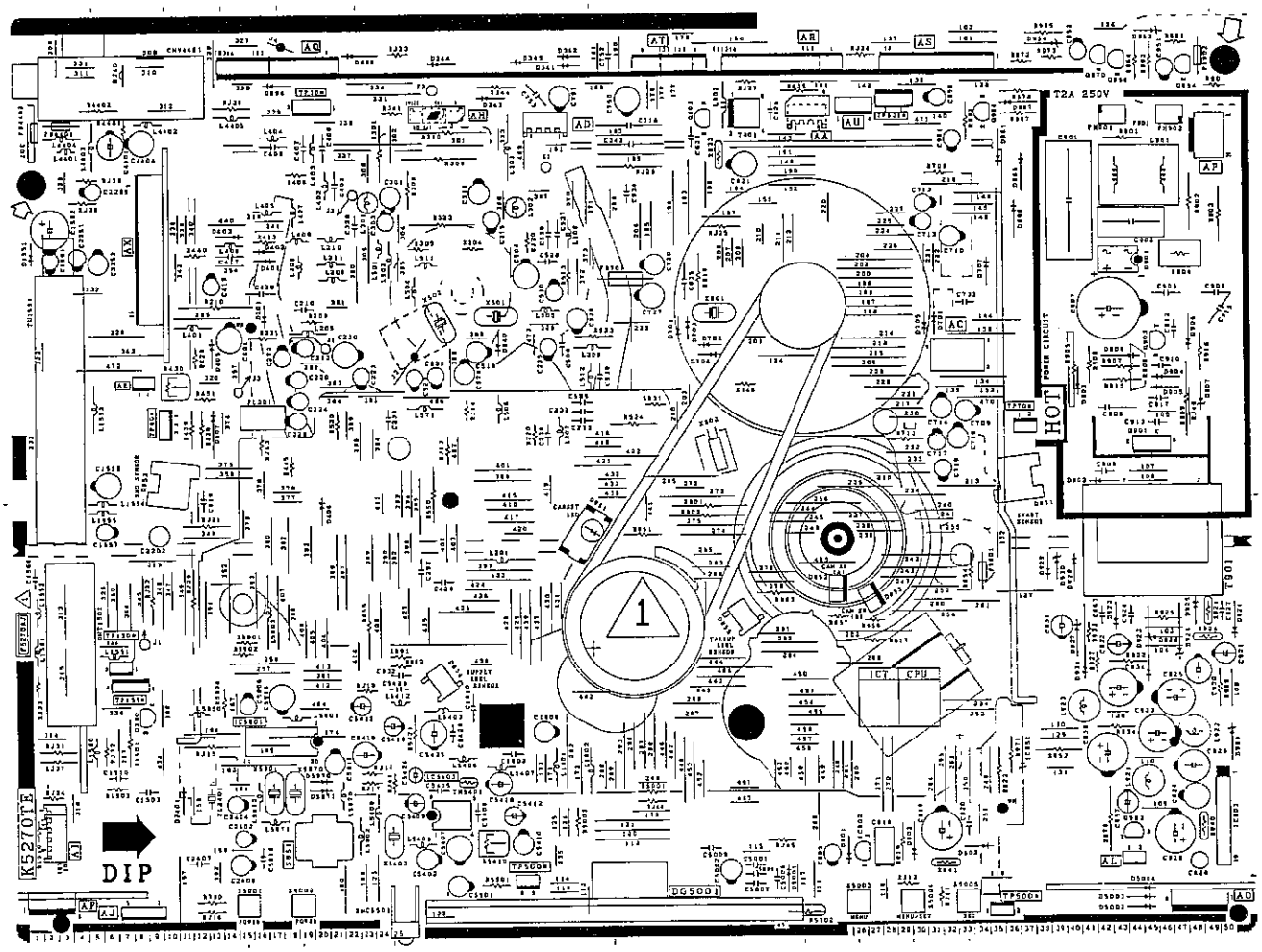
ELECTRICAL ADJUSTMENT

Notes:

- Before the adjustment:
  Electrical adjustments discussed here are often required after replacement of electronic components and mechanical parts such as video heads.
  Check that the mechanism and all electric components are in good working condition prior to the adjustments, otherwise adjustments can not be completed.

- Instruments required:
  - ◎ Colour TV monitor
  - ◎ Audio signal generator
  - ◎ DC voltmeter
  - ◎ Blank video cassette tape
  - ◎ Screwdriver for adjustment
  - ◎ Colour bar signal generator
  - ◎ Dual-trace oscilloscope
  - ◎ AC milli-voltmeter
  - ◎ Frequency counter
  - ◎ Alignment tape (VROCPSV)
  - ◎ Alignment tape (VROATSV)
  - ◎ Alignment tape (VROCBFFS)

* Servicing precautions
When the IC804 (E^2PROM) has been replaced, make the following reprogramming. Depending on models, the IC804 (E^2PROM) has been factory-adjusted for it's memory function.
It's therefore necessary to reprogram the memory function for the model in question.
Note that the servo circuit requires readjustments for the head switching point, slow and still modes.



SERVO CIRCUIT ADJUSTMENT

1. ADJUSTMENT OF HEAD SWITCHING POINT

Measuring instrument	Dual-trace oscilloscope and Colour TV monitor
Mode	Playback
Cassette	Alignment tape (VROCPSV)
Test point	TP302 (H.SW.P.) to CH-1, VIDEO OUT jack to CH-2 (CH-1 trigger slope switch at (+), Internal trigger at CH-1 side.)
Specification	6.5 ± 0.5H (lines)

1. Remove the front panel and play the alignment tape. (VROCPSV)
   (Playback picture on the monitor screen.)
2. Make for a moment short-circuited between TP5001 and TP5002, both located at the front side on the main PWB.
   Be sure that all the fluorescent display tubes light up into the TEST mode.
   (See Note below)
3. Press the PLAY button.
   Be sure the "PLAY" appears in the fluorescent display tubes flashing (about 1Hz) into the auto PG adjustment operating.
   Note:
   When the manual PG adjustment, observe the waveform with an oscilloscope and make adjustment FF or REW button so that the specification.
4. Stop the "PLAY" appears in the flashing of fluorescent display tubes at adjusted.
5. Press the STOP button in the return to normal mode.
6. Make this checking of waveform on the oscilloscope screen be as shown in Figure 1. just after the head switching point have been adjusted.

Notes:

① Set-up of TEST mode.
When the adjustment of HEAD SWITCHING POINT, AUTO TRACKING function is invalid.

② When the cassette housing control ass'y is removed, set-up of mechanism operating mode.

1) Replug the AC power cord it a few minutes later.
2) Make a short-circuited between TP5005 and TP5006, both located at the front side on the main PWB with a 22 ohm resistor, to tracking in center.
3) AC power cord is plugged in.
4) You can mechanism operating mode, Replug the AC power cord it a few minutes later.

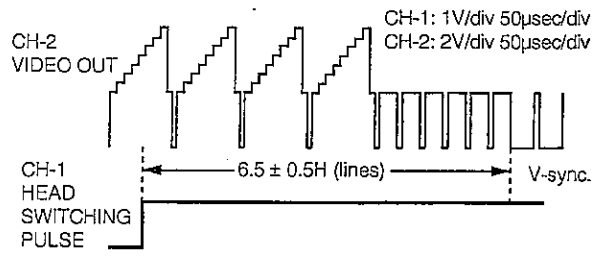


Figure 1.

2. ADJUSTMENT OF 2 HEAD PAL SYSTEM SLOW TRACKING PRESET

Measuring instrument	Colour TV monitor
Mode	Playback
Cassette	Self-recorded tape (See Note below)
Control	Tracking control buttons (+) or (–)
Specification	Minimized noise on monitor screen

1. Have the unit to receive a good TV broadcast or feed a video signal to the VIDEO IN jack. (See note ② below)
2. Record the signal on tape.
3. Rewind and play the tape where signal was recorded in above step.
4. Press the SLOW button on the remote control, and playback the recorded portion in the slow mode.
5. Make for a moment short-circuited between TP5001 and TP5002, both located at the front side on the main PWB.
   Be sure that all the fluorescent display tubes light up into the TEST mode.
6. Look at the monitor screen and adjust the (+) or (–) TRACKING buttons so that the there is noise disappears from the screen.
7. Press the STOP button in the return to normal mode.
8. Play the tape a few seconds then press the SLOW button again and make sure there is on noise in the screen.

Notes:

① Self-recorded tape means a cassette whose program was recorded by the unit being adjusted.

② The TV program will not be recorded if RCA or 21pin plugs are pluged in to the AUDIO/VIDEO input terminals.

3. ADJUSTMENT OF 2 HEAD NTSC SYSTEM SLOW TRACKING PRESET

Measuring instrument	Colour TV monitor
Mode	Playback
Cassette	Alignment tape (VROATSV)
Control	Tracking control buttons (+) or (–)
Specification	Minimized noise on monitor screen

1. Insert the NTSC system alignment tape (VROATSV) and put the unit in the SP portion playback mode.
2. Press the SLOW button on the remote control, and playback the alignment tape in the slow mode.
3. Make for a moment short-circuited between TP5001 and TP5002, both located at the front side on the main PWB.
   Be sure that all the fluorescent display tubes light up into the TEST mode.
4. Look at the monitor screen and adjust the (+) or (-) TRACKING buttons so that the there is noise disappears from the screen.
5. Press the STOP button in the return to normal mode.
6. Play the tape a few seconds then press the SLOW button again and make sure there is on noise in the screen.

4. ADJUSTMENT OF 4 HEAD PAL SYSTEM SP/LP SLOW TRACKING PRESET

Measuring instrument	Colour TV monitor
Mode	Playback
Cassette	Self-recorded tape (SP/LP mode) (See Note below)
Control	Tracking control buttons (+) or (–)
Specification	Minimized noise on monitor screen

1. Have the unit to receive a good TV broadcast or feed a video signal to the VIDEO IN jack. (See note ② below)
2. Set the tape speed in SP mode by using the remote control and record the signal on tape.
3. Rewind and play the tape where signal was recorded in above step.
4. Press the SLOW button on the remote control, and playback the recorded portion in the slow mode.
5. Make for a moment short-circuited between TP5001 and TP5002, both located at the front side on the main PWB.
   Be sure that all the fluorescent display tubes light up into the TEST mode.
6. Look at the monitor screen and adjust the (+) or (-) TRACKING buttons so that the there is noise disappears from the screen.
7. Press the STOP button in the return to normal mode.
8. Play the tape a few seconds then press the SLOW button again and make sure there is on noise in the screen.
   (For the LP mode put adjustment at the same adjustment way as SP mode.)

Notes:

① Self-recorded tape means a cassette whose program was recorded by the unit being adjusted.

② The TV program will not be recorded if RCA or 21pin plugs are pluged in to the AUDIO/VIDEO input terminals.

5. ADJUSTMENT OF 4 HEAD NTSC SYSTEM SP/EP (LP) SLOW TRACKING PRESET

Measuring instrument	Colour TV monitor
Mode	Playback
Cassette	Alignment tape (VROATSV)
Control	Tracking control buttons (+) or (–)
Specification	Minimized noise on monitor screen

1. Insert the NTSC system alignment tape (VROATSV) and put the unit in the SP portion playback mode.
2. Press the SLOW button on the remote control, and playback the alignment tape in the slow mode.
3. Make for a moment short-circuited between TP5001 and TP5002, both located at the front side on the main PWB.
   Be sure that all the fluorescent display tubes light up into the TEST mode.
4. Look at the monitor screen and adjust the (+) or (-) TRACKING buttons so that the there is noise disappears from the screen.
5. Press the STOP button in the return to normal mode.
6. Play the tape a few seconds then press the SLOW button again and make sure there is on noise in the screen.
   (For the EP (LP) mode put adjustment at the same adjustment way as SP mode.)

6. ADJUSTMENT OF 2 HEAD PAL SYSTEM FV (False Vertical Sync) OF STILL PICTURE

Measuring instrument	Colour TV monitor
Mode	Playback still
Cassette	Self-recorded tape (See Note below②)
Control	Tracking control buttons (+) or (–)
Specification	No vertical jitter of picture

1. Play a cassette which was recorded.
2. Press the PAUSE/STILL button to freeze the picture.
3. Look at the monitor screen and adjust (+) or (-) TRACKING buttons so that the vertical jitter of the picture to be minimized.
4. Play and freeze the self-recorded tape and make sure vertical jitter of the picture is not noticeable.

Notes:

① The FV goes back to the it's initial state when the unit is put into the system controller reset mode due to power failure, etc.
In this case, preset the FV once again.

② Self-recorded tape is a cassette whose program was recorded by the unit being adjusted.

7. ADJUSTMENT OF 2 HEAD NTSC SYSTEM FV (False Vertical Sync) OF STILL PICTURE

Measuring instrument	Colour TV monitor
Mode	Playback still
Cassette	Alignment tape (VROATSV)
Control	Tracking control buttons (+) or (–)
Specification	No vertical jitter of picture

1. Insert the NTSC system alignment tape (VROATSV) and put the unit in the SP portion playback mode.
2. Press the PAUSE/STILL button to freeze the picture.
3. Look at the monitor screen and adjust (+) or (-) TRACKING buttons so that the vertical jitter of the picture to be minimized.
4. Play and freeze the self-recorded tape and make sure vertical jitter of the picture is not noticeable.

Note:

The FV goes back to the it's initial state when the unit is put into the system controller reset mode due to power failure, etc.
In this case, preset the FV once again.

8. ADJUSTMENT OF 4 HEAD PAL SYSTEM FV (False Vertical Sync) OF STILL PICTURE

Measuring instrument	Colour TV monitor
Mode	Playback still
Cassette	Self-recorded tape (SP mode) (See Note below②)
Control	Tracking control buttons (+) or (–)
Specification	No vertical jitter of picture

1. Play a cassette which was recorded by the unit in SP mode.
2. Press the PAUSE/STILL button to freeze the picture.
3. Look at the monitor screen and adjust (+) or (-) TRACKING buttons so that the vertical jitter of the picture to be minimized.
4. Play and freeze the self-recorded tape in SP mode and make sure vertical jitter of the picture is not noticeable.
   (For the LP mode put adjustment at the same adjustment way as SP mode.)

Notes:

① The FV goes back to the it's initial state when the unit is put into the system controller reset mode due to power failure, etc.
In this case, preset the FV once again.

② Self-recorded tape is a cassette whose program was recorded by the unit being adjusted.

9. ADJUSTMENT OF 4 HEAD NTSC SYSTEM FV (False Vertical Sync) OF STILL PICTURE

Measuring instrument	Colour TV monitor
Mode	Playback still
Cassette	Alignment tape (VROATSV)
Control	Tracking control buttons (+) or (–)
Specification	No vertical jitter of picture

1. Insert the NTSC system alignment tape (VROATSV) and put the unit in the SP portion playback mode.
2. Press the PAUSE/STILL button to freeze the picture.
3. Look at the monitor screen and adjust (+) or (-) TRACKING buttons so that the vertical jitter of the picture to be minimized.
4. Play and freeze the self-recorded tape in SP mode and make sure vertical jitter of the picture is not noticeable.
   (For the EP (LP) mode put adjustment at the same adjustment way as SP mode.)

Note:

The FV goes back to the it's initial state when the unit is put into the system controller reset mode due to power failure, etc.
In this case, preset the FV once again.

SERVO CIRCUIT ADJUSTMENT

1. ADJUSTMENT OF HEAD SWITCHING POINT

Measuring instrument	Dual-trace oscilloscope and Colour TV monitor
Mode	Playback
Cassette	Alignment tape (VROCPSV)
Test point	TP302 (H.SW.P.) to CH-1, VIDEO OUT jack to CH-2 (CH-1 trigger slope switch at (+), Internal trigger at CH-1 side.)
Specification	6.5 ± 0.5H (lines)

1. Remove the front panel and play the alignment tape. (VROCPSV)
   (Playback picture on the monitor screen.)
2. Make for a moment short-circuited between TP5001 and TP5002, both located at the front side on the main PWB.
   Be sure that all the fluorescent display tubes light up into the TEST mode.
   (See Note below)
3. Press the PLAY button.
   Be sure the "PLAY" appears in the fluorescent display tubes flashing (about 1Hz) into the auto PG adjustment operating.
   Note:
   When the manual PG adjustment, observe the waveform with an oscilloscope and make adjustment FF or REW button so that the specification.
4. Stop the "PLAY" appears in the flashing of fluorescent display tubes at adjusted.
5. Press the STOP button in the return to normal mode.
6. Make this checking of waveform on the oscilloscope screen be as shown in Figure 1. just after the head switching point have been adjusted.

Notes:

① Set-up of TEST mode.
When the adjustment of HEAD SWITCHING POINT, AUTO TRACKING function is invalid.

② When the cassette housing control ass'y is removed, set-up of mechanism operating mode.

1) Replug the AC power cord it a few minutes later.
2) Make a short-circuited between TP5005 and TP5006, both located at the front side on the main PWB with a 22 ohm resistor, to tracking in center.
3) AC power cord is plugged in.
4) You can mechanism operating mode, Replug the AC power cord it a few minutes later.

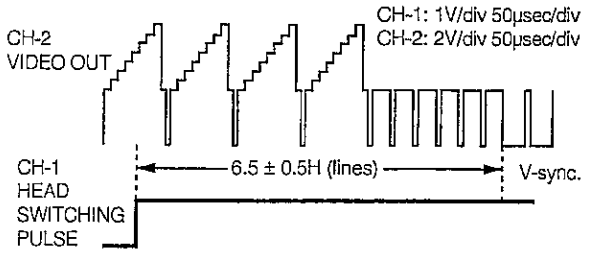


Figure 1.

2. ADJUSTMENT OF SP/LP SLOW TRACKING PRESET (2 HEAD LP MODELS ONLY)

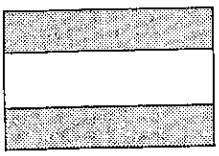
Measuring instrument	Colour TV monitor
Mode	Playback
Cassette	Self-recorded tape (See Note below)
Control	Tracking control buttons (+) or (–)
Specification	Reference of following step 6.

1. Have the unit to receive a good TV broadcast or feed a video signal to the VIDEO IN jack. (See note ② below)
2. Set the tape speed in SP mode by using the remote control and record the signal on tape.
3. Rewind and play the tape where signal was recorded in above step.
4. Press the SLOW button on the remote control, and playback the recorded portion in the slow mode.
5. Make for a moment short-circuited between TP5001 and TP5002, both located at the front side on the main PWB.
   Be sure that all the fluorescent display tubes light up into the TEST mode.
6. Look at the monitor screen and adjust the (+) or (–) TRACKING buttons so that the position of noise come following Figure 2 (a) and (b).
7. Press the STOP button in the return to normal mode.
8. Play the tape a few seconds then press the SLOW button again and make sure there is on noise in the screen.
   (For the LP mode put adjustment at the same adjustment way as SP mode.)

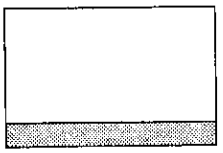
Notes:

① Self-recorded tape means a cassette whose program was recorded by the unit being adjusted.

② The TV program will not be recorded if RCA or 21pin plugs are pluged in to the AUDIO/VIDEO input terminals.



(SP)
Figure 2(a)



(LP)
Figure 2(b)

The mark of ▒ is noise.

3. ADJUSTMENT OF FV (False Vertical Sync) OF STILL PICTURE (2 HEAD LP MODELS ONLY)

Measuring instrument	Colour TV monitor
Mode	Playback still
Cassette	Self-recorded tape (See Note below ②)
Control	Tracking control buttons (+) or (–)
Specification	No vertical jitter of picture

1. Play a cassette which was recorded.
2. Press the PAUSE/STILL button to freeze the picture.
3. Look at the monitor screen and adjust (+) or (–) TRACKING buttons so that the vertical jitter of the picture to be minimized.
4. Play and freeze the self-recorded tape and make sure vertical jitter of the picture is not noticeable.
   (For the LP mode put adjustment at the same adjustment way as SP mode.)

Notes:

① The FV goes back to the it's initial state when the unit is put into the system controller reset mode due to power failure, etc.
In this case, preset the FV once again.

② Self-recorded tape is a cassette whose program was recorded by the unit being adjusted.

Y/C CIRCUIT ADJUSTMENT

1. CHECKING OF VIDEO E-E LEVEL

Measuring instrument	Oscilloscope
Mode	E-E or Record
Input signal	EIA colour bar (1.0Vp-p)
Test point	VIDEO OUT jack
Specification	1.0 ± 0.1Vp-p

1. Connect a 75 ohm terminating resistor to the VIDEO OUT jack and connect an oscilloscope across this terminating resistor.
   (See Note below.)
2. Feed a colour bar signal to the VIDEO IN jack.
3. Make sure that the E-E signal amplitude is 1.0Vp-p as shown in Figure 1.

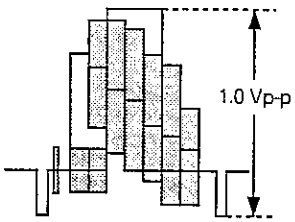


Figure 1.

Notes:
If the 75 ohm terminating resistor is missing, the signal amplitude will be doubled.

2. CHECKING OF WHITE CLIP LEVEL

Measuring instrument	Oscilloscope
Mode	E-E or Record
Input signal	EIA colour bar (1.0Vp-p)
Test point	Pin (48) of IC401, GND
Specification	190 ± 5% (See note below)

1. Connect an oscilloscope to pin (48) of IC401 and GND.
2. Feed the colour bar signal to the VIDEO IN jack and set the unit in E-E or recording mode.
3. Make sure that the overshoot of the video signal is clipped at 190% as shown in Figure 2.

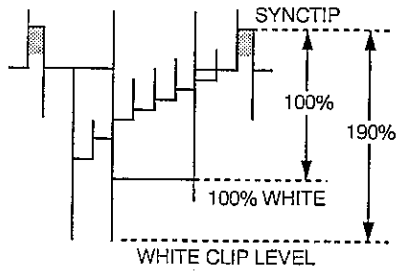


Figure 2.

Note:
From sync tip to white peak, the level is 100%.
The white clip level is 90% above the white level.

3. CHECKING OF RECORD LEVEL

Measuring instrument	Dual-trace oscilloscope
Mode	Record mode
Input signal	EIA colour bar (1.0Vp-p)
Test point	Chroma (Red) R514 terminal lead at L509 side (Sig.) ~ GND. Sync tip R225 terminal lead at L210 side (Sig.) ~ GND.
Specification	Chroma (Red): about 400~600mVp-p Sync tip: about 150~220mVp-p

1. Feed the colour bar signal to the VIDEO IN jack and set the unit in recording mode.
2. Connect a dual -trace oscilloscope to shown in table.
3. Make sure so that the amplitude of the chroma (Red) portion and sync tip portion is specified as shown in Figure 3.

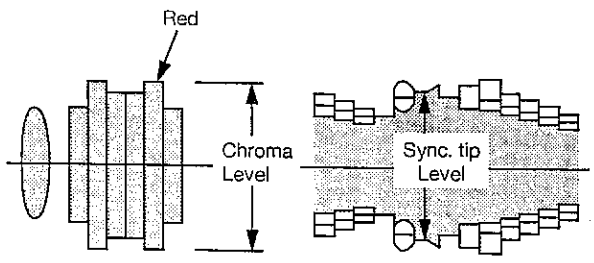


Figure 3 (a).

Figure 3 (b).

4. CHECKING OF PLAYBACK LEVEL

Measuring instrument	Oscilloscope
Mode	Record/Playback
Input signal	EIA colour bar (1.0Vp-p)
Test point	VIDEO OUT jack
Specification	1.0 ± 0.1Vp-p

1. Be sure that E-E level has been correctly specificed.
2. Connect a 75 ohm terminating resistor to the VIDEO OUT jack and connect an oscilloscope across this terminating resistor.
   (See Note below ①.)
3. Feed a colour bar signal to the VIDEO IN jack and set the unit in recording mode.
4. Play the colour bar portion of the recorded tape.
5. Make sure that the output signal amplitude is 1.0Vp-p as shown in Figure 4.

Notes:

① If the 75 ohm terminating resistor is missing, the signal amplitude will be doubled.

② Set the S.PICTURE switch turn off.

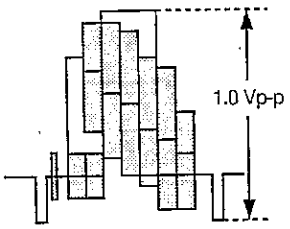


Figure 4.

5. ADJUSTMENT OF S.PICTURE

Measuring instrument	DC voltmeter/Colour TV monitor
Mode	E-E or Record
Input signal	EIA colour bar (1.0Vp-p) or monoscope (1.0Vp-p)
Test point	TP401 (Sig.) ~ TP402 (GND)
Control	R430 S.PICTURE control
Specification	7.7 ± 0.1V

1. Connect a DC voltmeter to the test points TP401 (Sig.) ~ TP402 (GND).
2. Feed a colour bar or monoscope signal to the VIDEO IN jack.
3. Set the S.PICTURE switch turn on.
4. Adjust R430 (S.PICTURE control) so that the DC voltmeter reads specified value, and checking of make sure so that the nothing unusual on the playback monoscope screen.

AUDIO CIRCUIT

1. CHECKING OF E-E LEVEL

Measuring instrument	AC milli-voltmeter
Mode	E-E/Record
Input signal	1kHz, –8.0dBs (at RCA type jack) 1kHz, –3.8dBs (at 21pin type jack)
Test point	AUDIO OUT jack
Specification	–8.0 ± 2dBs (at RCA type jack) –3.8 ± 2dBs (at 21pin type jack)

1. Connect an AC milli-voltmeter to the AUDIO OUT jack.
2. Feed the audio signal shown in table to the AUDIO IN jack.
3. Put the unit in E-E or recording mode.
4. Make sure that the output level is value shown in table.

2. CHECKING OF AUDIO PLAYBACK LEVEL

Measuring instrument	AC milli-voltmeter
Mode	Playback
Input signal	Alignment tape.(VROCPSV) (1kHz level control signal.)
Test point	AUDIO OUT jack
Specification	$-9\ ^{+2dBs}_{-1dBs}$ (at RCA type jack) $-7.8\ ^{+2dBs}_{-1dBs}$ (at 21 pin type jack)

1. Playback the Alignment tape. (VROCPSV 1kHz level audio signal)
2. Connect an AC milli-voltmeter to the AUDIO OUT jack.
3. Make sure that the output level is value shown in table.

3. CHECKING OF AUDIO RECORD LEVEL

Measuring instrument	AC milli-voltmeter
Mode	Record/playback
Input signal	1kHz, –8.0dBs (at RCA type jack) 1kHz, –3.8dBs (at 21pin type jack)
Test point	AUDIO OUT jack
Specification	–8.0 ± 3dBs (at RCA type jack) –3.8 ± 3dBs (at 21pin type jack)

1. Connect an AC milli-voltmeter to the AUDIO OUT jack.
2. Feed the audio signal shown in table to the AUDIO IN jack.
3. Make the self-recording and playback of the signal.
4. Make sure that the output level is value shown in table.

4. CHECKING OF ERASE VOLTAGE AND OSCILLATION FREQUENCY

Measuring instrument	Oscilloscope
Mode	Record
Test point	Full erase head
Control	T601
Specification	70 ± 5kHz, 40Vp-p or greater

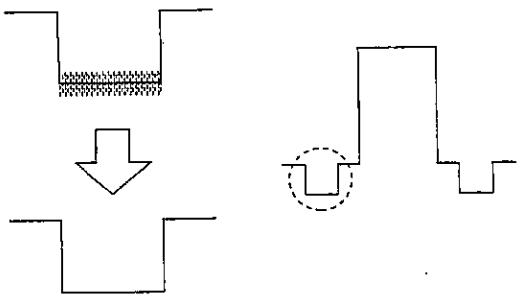
1. Put the unit in recording mode.
2. Connect an oscilloscope across the full erase head.
3. Make sure the erase voltage across the full erase head is approx. 40Vp-p or more and frequency is 70 ± 5kHz.

RF CIRCUIT

1. ADJUSTMENT OF RF AGC CIRCUIT (Except G/S/H/L version)

Measuring instrument	Oscilloscope
Mode	Good TV Commercial broadcast reception
Test point	TP1553 (Sig.) TP1554 (GND)
Control	VR001 AGC control
Specification	Just befor shrinking (See of Figure 1.)

1. Have the unit received good TV commercial broadcast reception.
   (Input field strength: 80 dBμV of antenna terminal.)
2. Connect an oscilloscope to test points TP1553 (Sig.) and TP1554 (GND).
3. Observe the video output terminal waveform on the oscilloscope.
   Adjust VR001 (AGC control) in the IF pack until the noise disappears from the oscilloscope screen and the waveform nearly comes into sync.



Just before shirking

Figure 2.

2. ADJUSTMENT OF RF AGC CIRCUIT (For G/S version)

Measuring instrument	DC voltmeter and VHF signal generator
Mode	RF signal at E12-CH (by VHF signal generator) (EBU colour bar signal at 87.5% modulated.)
Test point	TP1552 (+) ~ TP1554 (GND)
Control	VR001 AGC control
Specification	2.55 ± 0.1V

1. Receive the E12 channel signal (colour bar signal at 87.5% modulated.) at Input field strenght: 70dBμV of antenna terminal.
2. Connect a DC voltmeter to test points shown in table.
3. Adjust VR001 (AGC control) in the IF pack so that the voltage be specified.

3. ADJUSTMENT OF RF AGC CIRCUIT (For H version)

Measuring instrument	DC voltmeter and VHF signal generator
Mode	RF signal at I69-CH (by UHF signal generator) (EBU colour bar signal at 87.5% modulated.)
Test point	TP1552 (+) ~ TP1554 (GND)
Control	VR001 AGC control
Specification	3.7 ± 0.1V

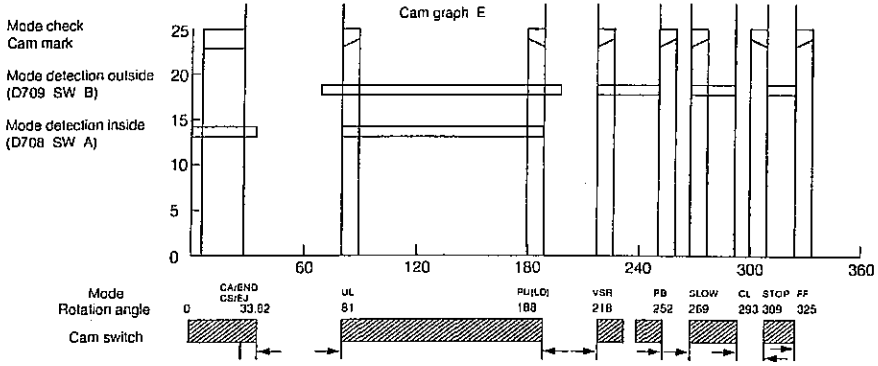
1. Receive the I69 channel signal (colour bar signal at 87.5% modulated.) at Input field strength: 70dBμV of antenna terminal.
2. Connect a DC voltmeter to test points shown in table.
3. Adjust VR001 (AGC control) in the IF pack so that the voltage be specified.

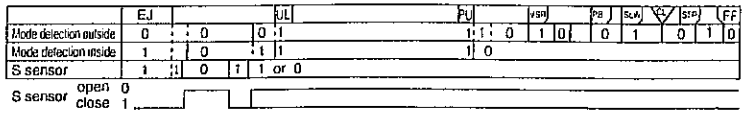
6. MECHANISM OPERATION FLOWCHART AND TROUBLESHOOTING GUIDE

MECHANISM OPERATION FLOWCHART

* This flowchart describes the outline of the mechanism's operation, but does not give its details.

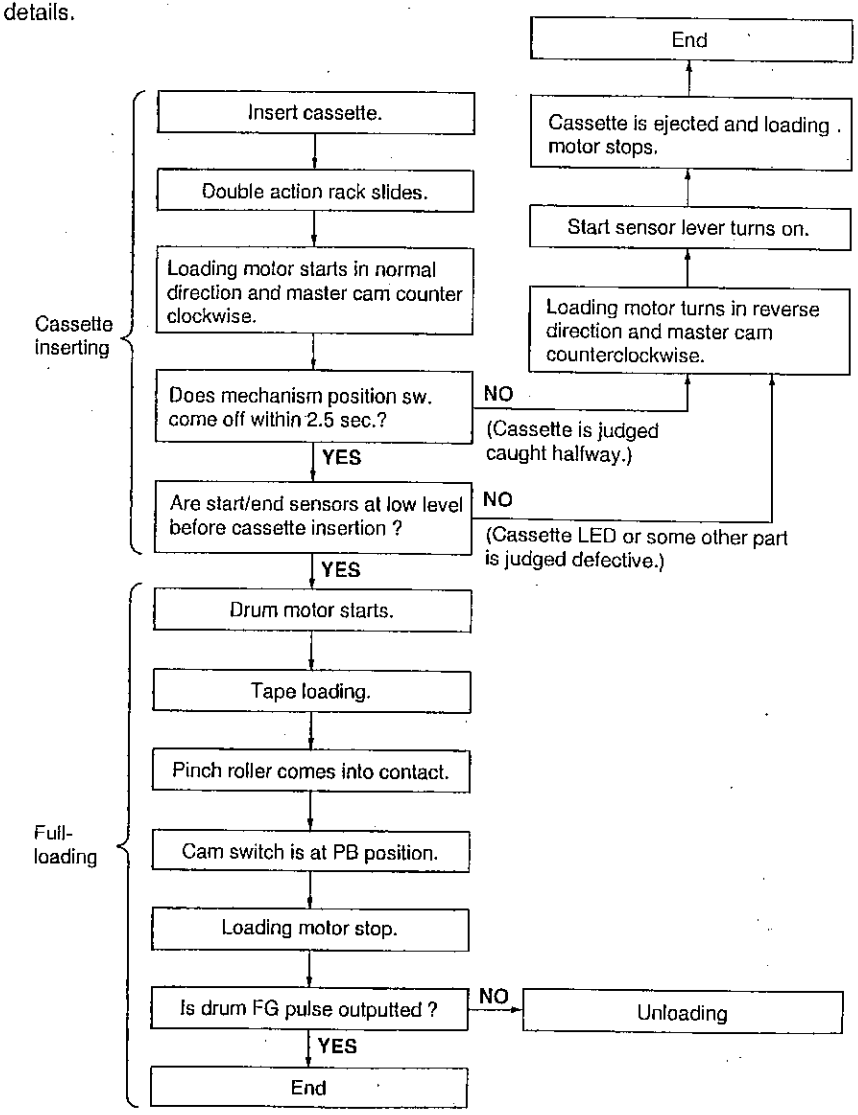
F mechanical timing



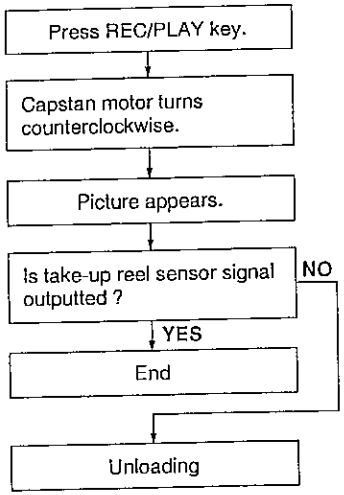


	Mode detection inside Sensor A	Mode detection outside Sensor B
CS/EJ	1	0
ULD	1	1
PU LD	1	1
VSR	0	1
PB	0	0
STILL	0	1
CL	0	0
STOP	0	0
FF	0	0

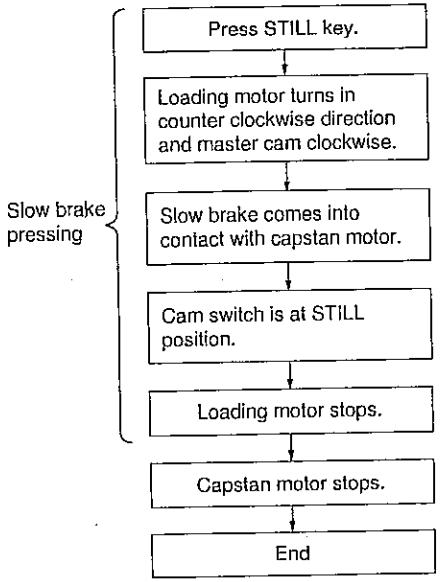
CASSETTE INSERTION → STOP


Insert cassette.
Double action rack slides.
Loading motor starts in normal direction and master cam counter clockwise.
Does mechanism position sw. come off within 2.5 sec.?
NO
(Cassette is judged caught halfway.)
YES
Are start/end sensors at low level before cassette insertion ?
NO
(Cassette LED or some other part is judged defective.)
YES
Cassette inserting
Drum motor starts.
Tape loading.
Pinch roller comes into contact.
Cam switch is at PB position.
Loading motor stop.
Is drum FG pulse outputted ?
NO
Unloading
YES
End
Full-loading
End
Cassette is ejected and loading motor stops.
Start sensor lever turns on.
Loading motor turns in reverse direction and master cam counterclockwise.

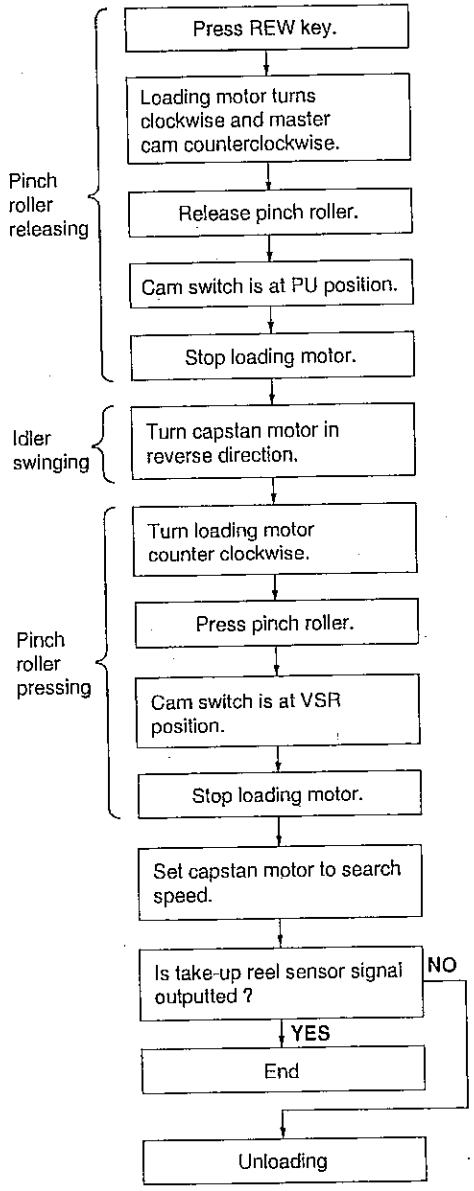
STOP → REC/PLAY



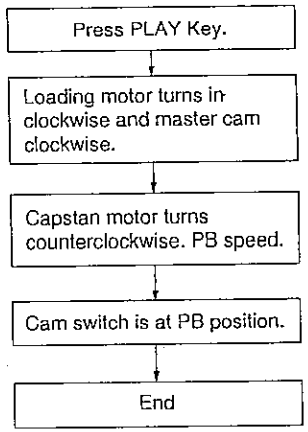
PLAY → STILL


Slow brake pressing
Press STILL key.
Loading motor turns in counter clockwise direction and master cam clockwise.
Slow brake comes into contact with capstan motor.
Cam switch is at STILL position.
Loading motor stops.
Capstan motor stops.
End

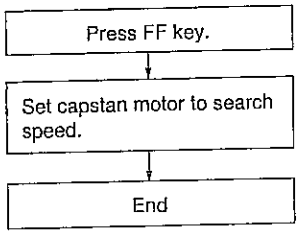
PLAY → VSR



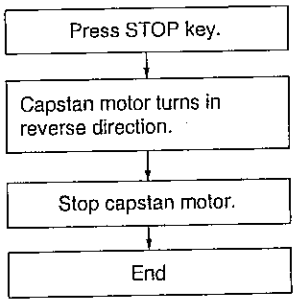
VSR → PLAY


Press PLAY Key.
Loading motor turns in clockwise and master cam clockwise.
Capstan motor turns counterclockwise. PB speed.
Cam switch is at PB position.
End

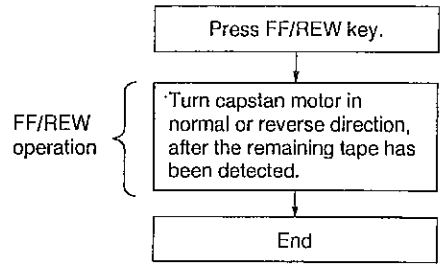
PLAY → VSF



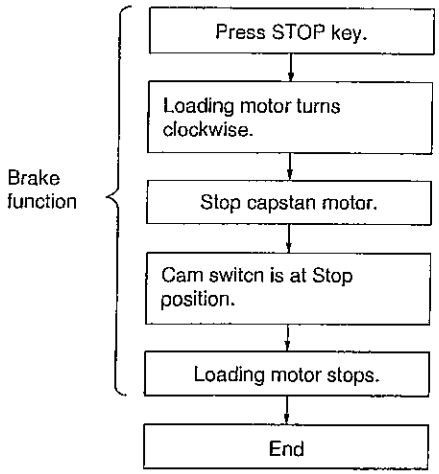
REC/PLAY → STOP



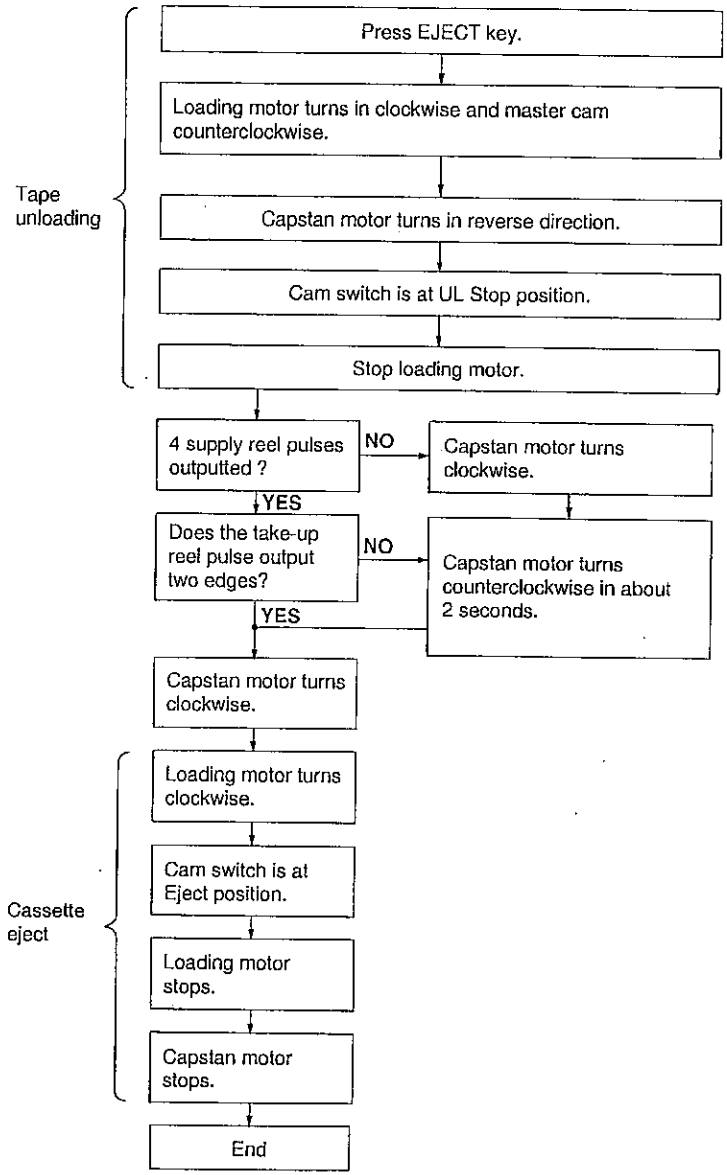
STOP → FF/REW

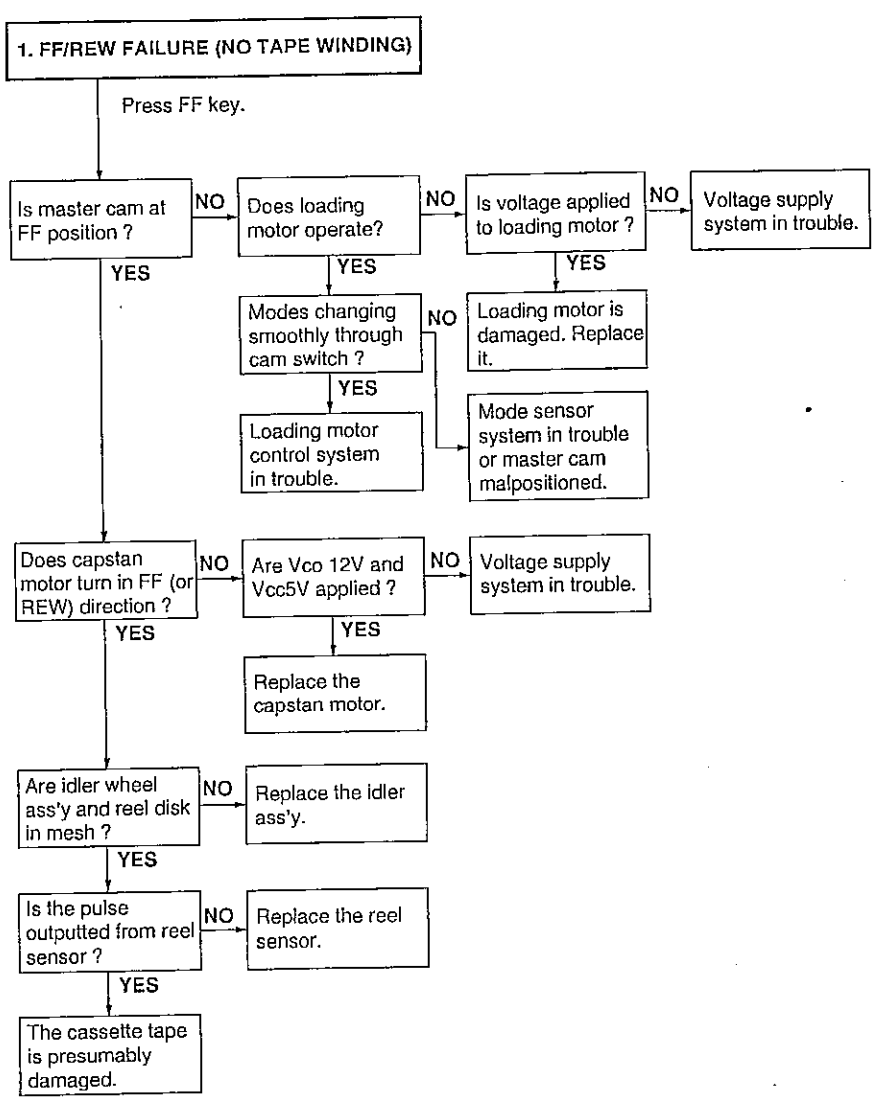

Press FF/REW key.
FF/REW operation
Turn capstan motor in normal or reverse direction, after the remaining tape has been detected.
End

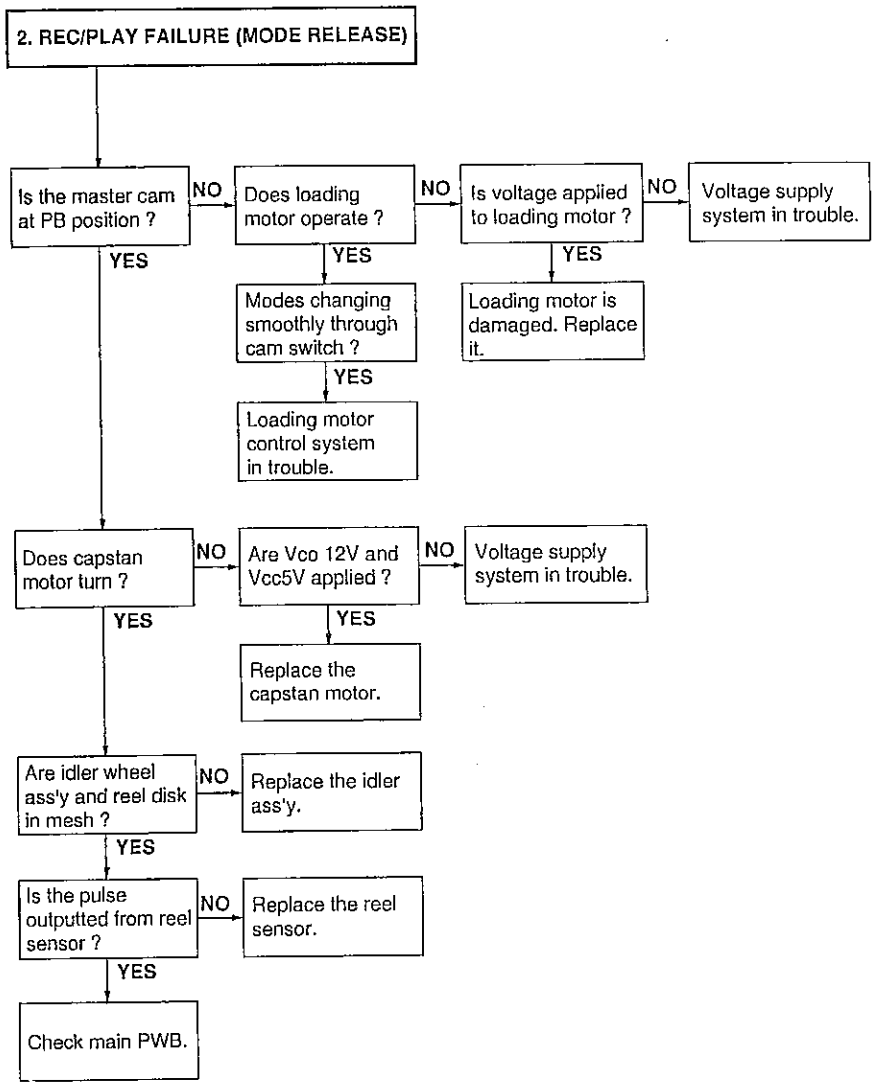
FF/REW → STOP

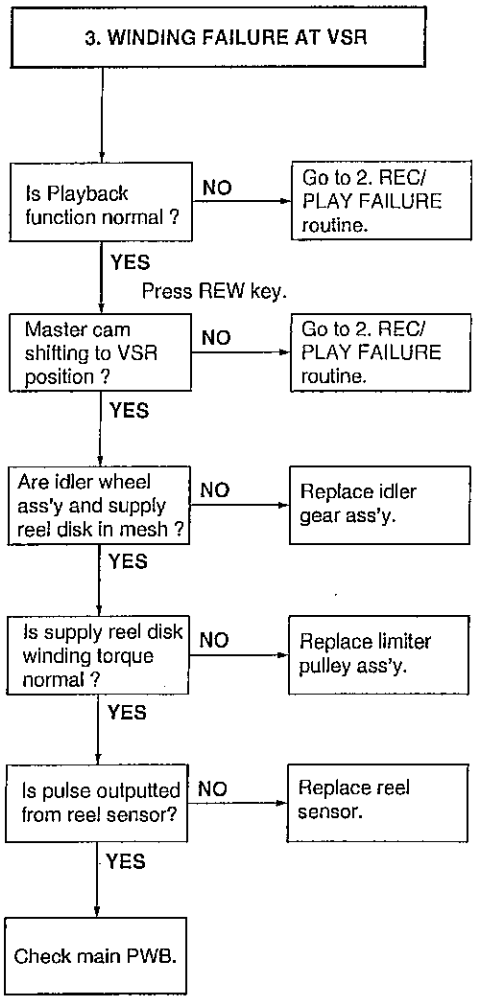


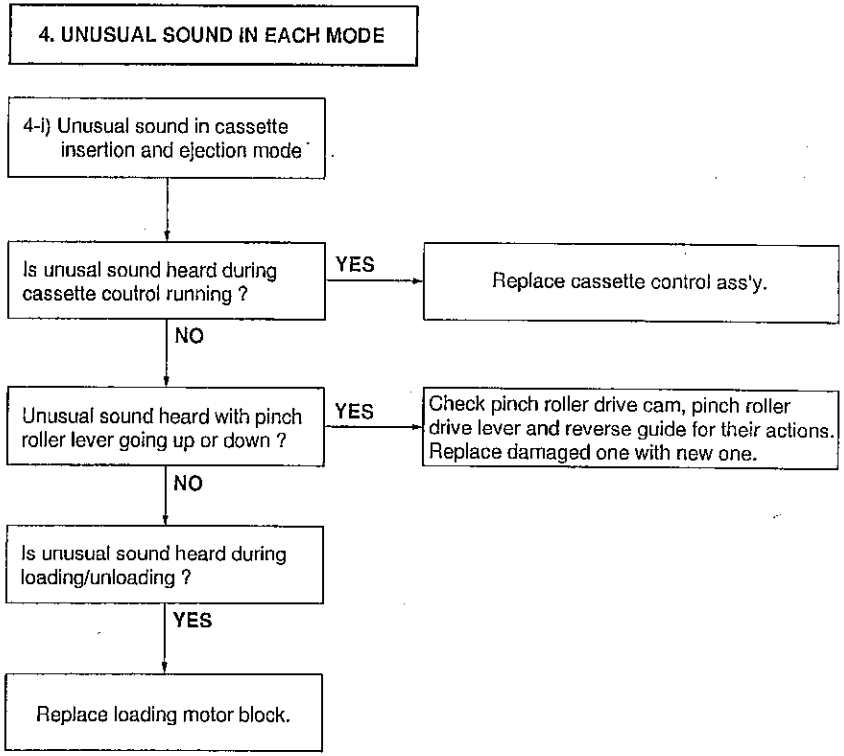
STOP → CASSETTE EJECT

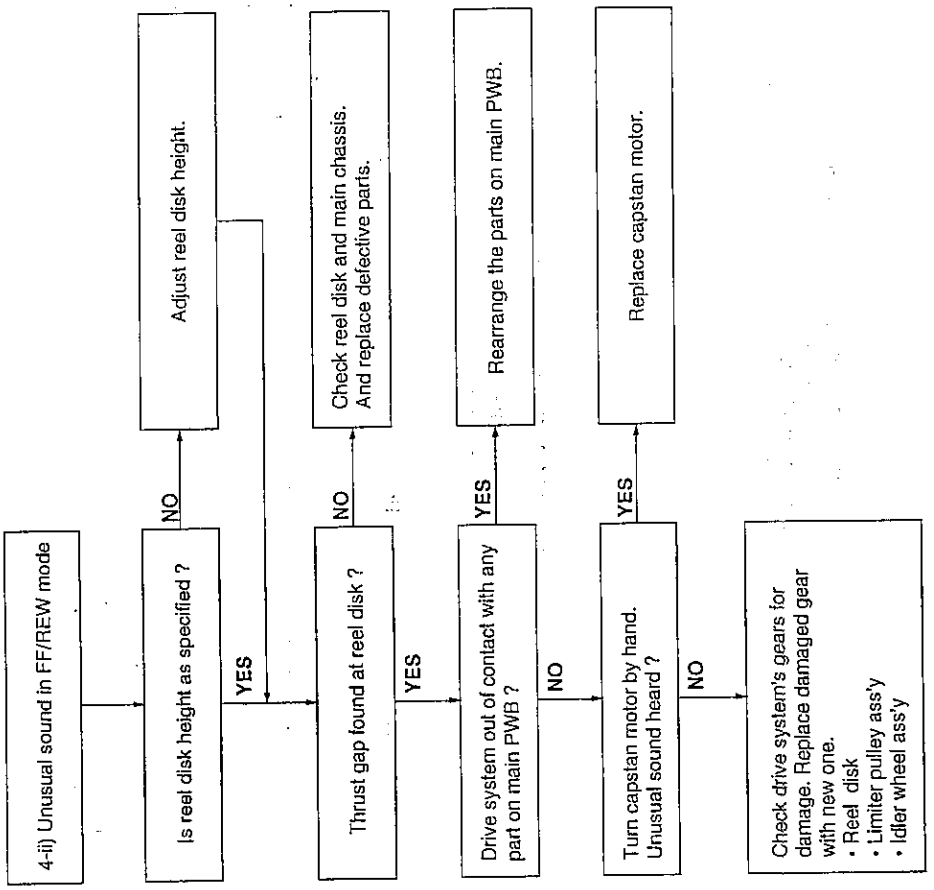

Press EJECT key.
Tape unloading
Loading motor turns in clockwise and master cam counterclockwise.
Capstan motor turns in reverse direction.
Cam switch is at UL Stop position.
Stop loading motor.
4 supply reel pulses outputted ?
NO
Capstan motor turns clockwise.
YES
Does the take-up reel pulse output two edges?
NO
Capstan motor turns counterclockwise in about 2 seconds.
YES
Capstan motor turns clockwise.
Cassette eject
Loading motor turns clockwise.
Cam switch is at Eject position.
Loading motor stops.
Capstan motor stops.
End


1. FF/REW FAILURE (NO TAPE WINDING)
Press FF key.
Is master cam at FF position ?
NO
Does loading motor operate?
NO
Is voltage applied to loading motor ?
NO
Voltage supply system in trouble.
YES
YES
YES
Modes changing smoothly through cam switch ?
NO
Loading motor is damaged. Replace it.
YES
Loading motor control system in trouble.
Mode sensor system in trouble or master cam malpositioned.
Does capstan motor turn in FF (or REW) direction ?
NO
Are Vco 12V and Vcc5V applied ?
NO
Voltage supply system in trouble.
YES
YES
Replace the capstan motor.
Are idler wheel ass'y and reel disk in mesh ?
NO
Replace the idler ass'y.
YES
Is the pulse outputted from reel sensor ?
NO
Replace the reel sensor.
YES
The cassette tape is presumably damaged.


2. REC/PLAY FAILURE (MODE RELEASE)
Is the master cam at PB position ?
NO
Does loading motor operate ?
NO
Is voltage applied to loading motor ?
NO
Voltage supply system in trouble.
YES
YES
YES
Modes changing smoothly through cam switch ?
Loading motor is damaged. Replace it.
YES
Loading motor control system in trouble.
Does capstan motor turn ?
NO
Are Vco 12V and Vcc5V applied ?
NO
Voltage supply system in trouble.
YES
YES
Replace the capstan motor.
Are idler wheel ass'y and reel disk in mesh ?
NO
Replace the idler ass'y.
YES
Is the pulse outputted from reel sensor ?
NO
Replace the reel sensor.
YES
Check main PWB.

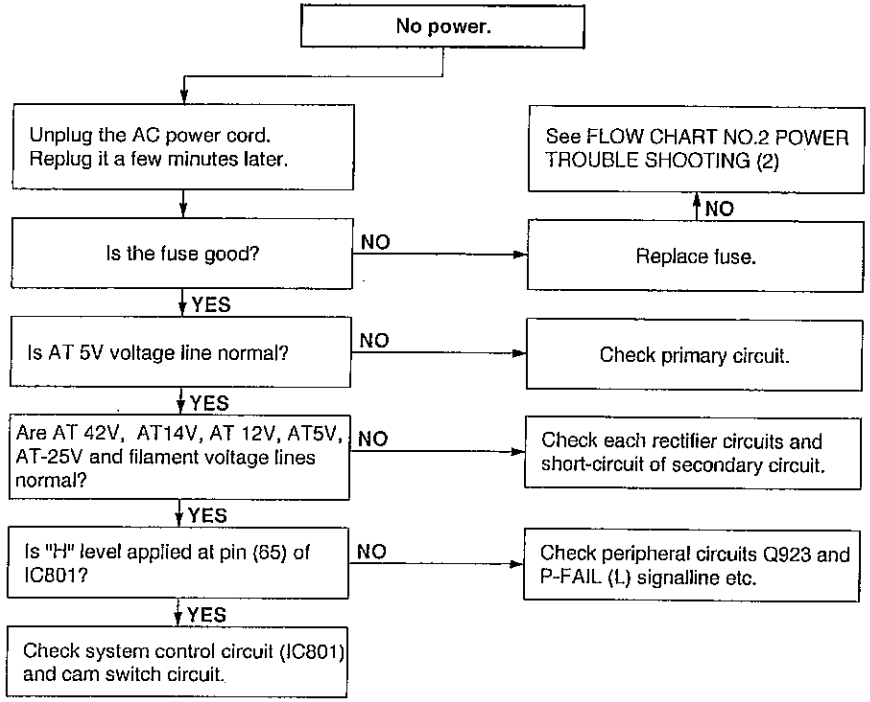

3. WINDING FAILURE AT VSR
Is Playback function normal ?
NO
Go to 2. REC/ PLAY FAILURE routine.
YES
Press REW key.
Master cam shifting to VSR position ?
NO
Go to 2. REC/ PLAY FAILURE routine.
YES
Are idler wheel ass'y and supply reel disk in mesh ?
NO
Replace idler gear ass'y.
YES
Is supply reel disk winding torque normal ?
NO
Replace limiter pulley ass'y.
YES
Is pulse outputted from reel sensor?
NO
Replace reel sensor.
YES
Check main PWB.


4. UNUSUAL SOUND IN EACH MODE
4-i) Unusual sound in cassette insertion and ejection mode
Is unusal sound heard during cassette coutrol running ?
YES
Replace cassette control ass'y.
NO
Unusual sound heard with pinch roller lever going up or down ?
YES
Check pinch roller drive cam, pinch roller drive lever and reverse guide for their actions. Replace damaged one with new one.
NO
Is unusual sound heard during loading/unloading ?
YES
Replace loading motor block.

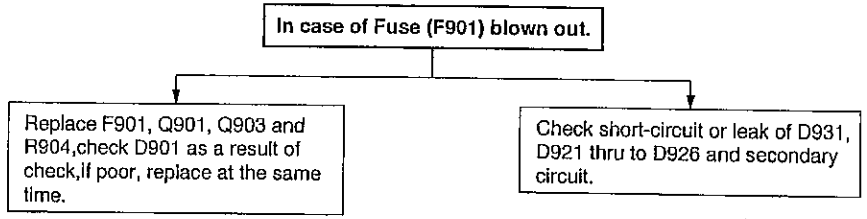

4-ii) Unusual sound in FF/REW mode
Is reel disk height as specified ?
NO
Adjust reel disk height.
YES
Thrust gap found at reel disk ?
NO
Check reel disk and main chassis.
And replace defective parts.
YES
Drive system out of contact with any part on main PWB ?
YES
Rearrange the parts on main PWB.
NO
Turn capstan motor by hand.
Unusual sound heard ?
YES
Replace capstan motor.
NO
Check drive system's gears for damage. Replace damaged gear with new one.
• Reel disk
• Limiter pulley ass'y
• Idler wheel ass'y

7. TROUBLESHOOTING

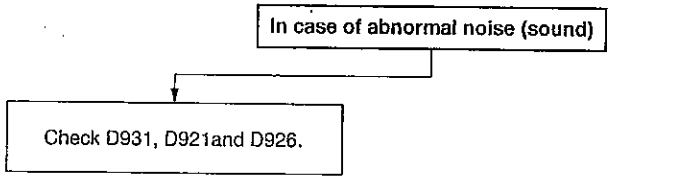
FLOW CHART NO.1 POWER TROUBLESHOOTING (1)


No power.
Unplug the AC power cord.
Replug it a few minutes later.
See FLOW CHART NO.2 POWER TROUBLE SHOOTING (2)
NO
Is the fuse good?
NO
Replace fuse.
YES
Is AT 5V voltage line normal?
NO
Check primary circuit.
YES
Are AT 42V, AT14V, AT 12V, AT5V, AT-25V and filament voltage lines normal?
NO
Check each rectifier circuits and short-circuit of secondary circuit.
YES
Is "H" level applied at pin (65) of IC801?
NO
Check peripheral circuits Q923 and P-FAIL (L) signalline etc.
YES
Check system control circuit (IC801) and cam switch circuit.

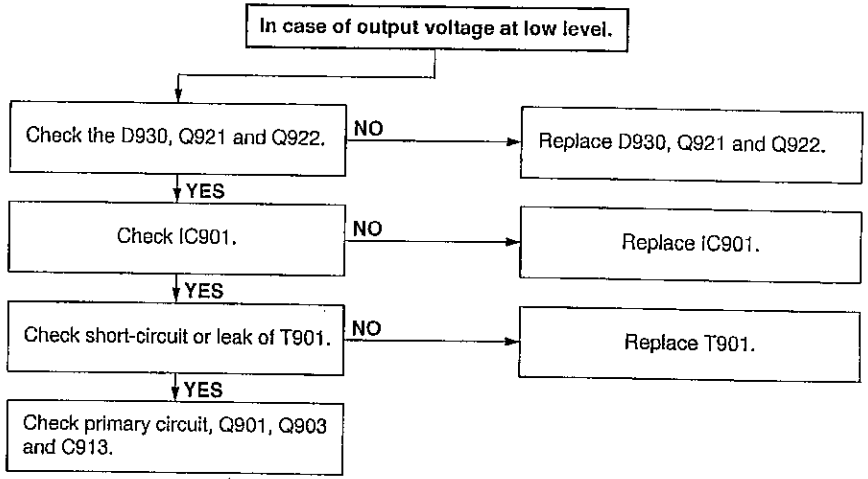
FLOW CHART NO.2 POWER TROUBLESHOOTING (2)


In case of Fuse (F901) blown out.
Replace F901, Q901, Q903 and R904,check D901 as a result of check,if poor, replace at the same time.
Check short-circuit or leak of D931, D921 thru to D926 and secondary circuit.

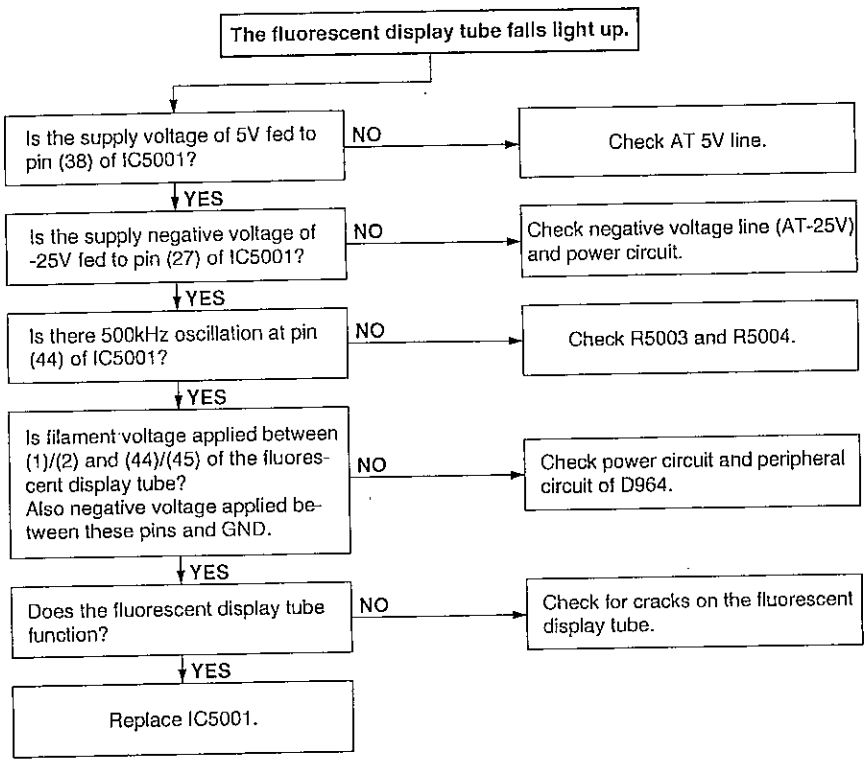
FLOW CHART NO.3 POWER TROUBLESHOOTING (3)



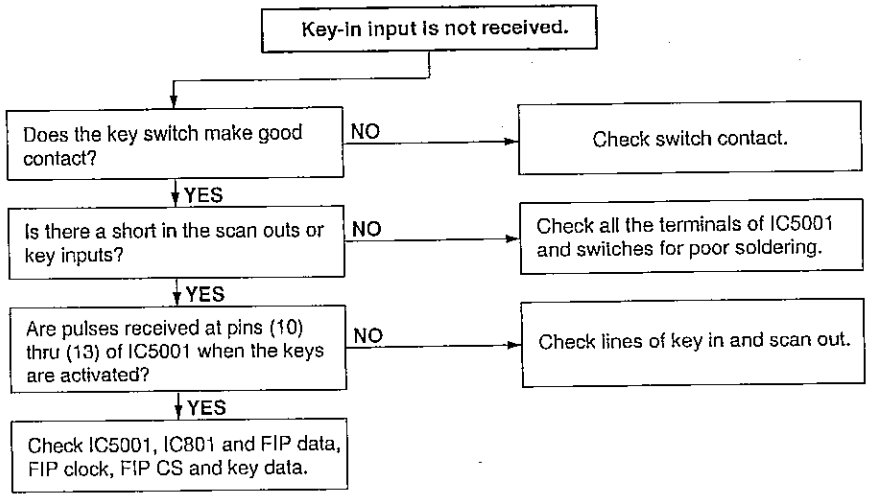
FLOW CHART NO.4 POWER TROUBLESHOOTING (4)



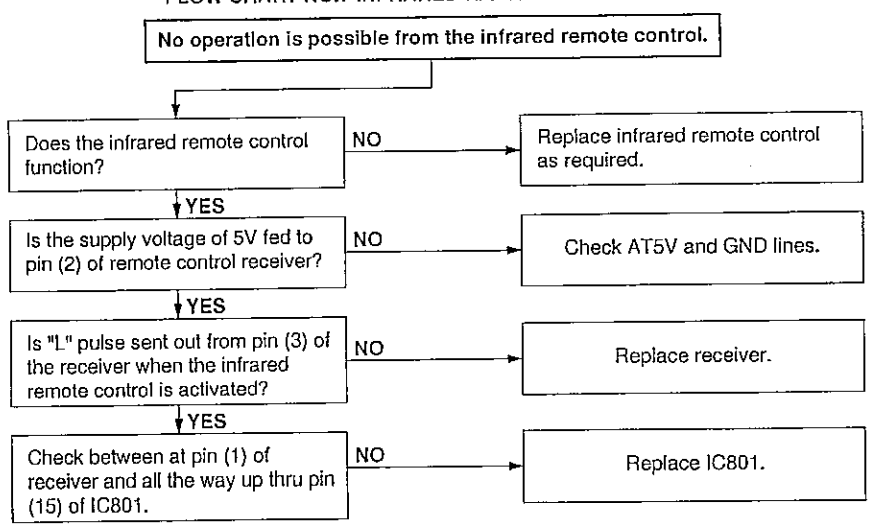
FLOW CHART NO.5 TIMER (1) TROUBLESHOOTING


The fluorescent display tube falls light up.
Is the supply voltage of 5V fed to pin (38) of IC5001?
NO
Check AT 5V line.
YES
Is the supply negative voltage of -25V fed to pin (27) of IC5001?
NO
Check negative voltage line (AT-25V) and power circuit.
YES
Is there 500kHz oscillation at pin (44) of IC5001?
NO
Check R5003 and R5004.
YES
Is filament voltage applied between (1)/(2) and (44)/(45) of the fluorescent display tube?
Also negative voltage applied between these pins and GND.
NO
Check power circuit and peripheral circuit of D964.
YES
Does the fluorescent display tube function?
NO
Check for cracks on the fluorescent display tube.
YES
Replace IC5001.

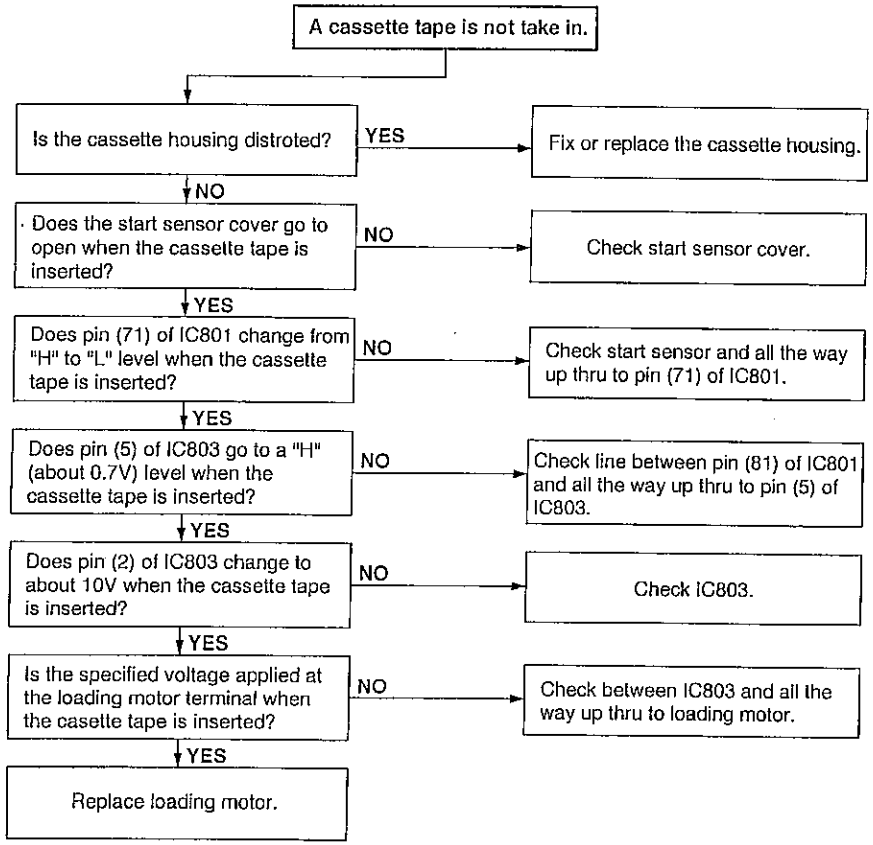
FLOW CHART NO.6 TIMER (2) TROUBLESHOOTING


Key-in input is not received.
Does the key switch make good contact?
NO
Check switch contact.
YES
Is there a short in the scan outs or key inputs?
NO
Check all the terminals of IC5001 and switches for poor soldering.
YES
Are pulses received at pins (10) thru (13) of IC5001 when the keys are activated?
NO
Check lines of key in and scan out.
YES
Check IC5001, IC801 and FIP data, FIP clock, FIP CS and key data.

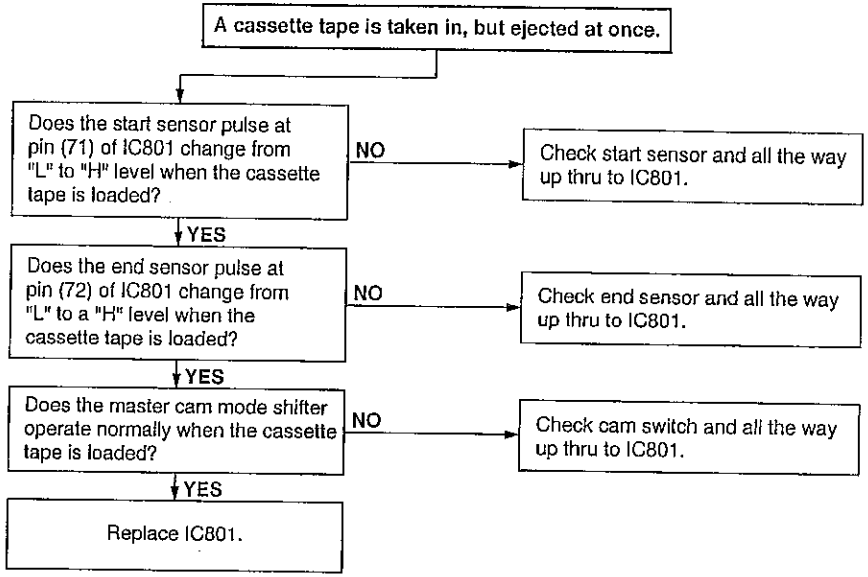
FLOW CHART NO.7 INFRARED R/C TROUBLESHOOTING


No operation is possible from the infrared remote control.
Does the infrared remote control function?
NO
Replace infrared remote control as required.
YES
Is the supply voltage of 5V fed to pin (2) of remote control receiver?
NO
Check AT5V and GND lines.
YES
Is "L" pulse sent out from pin (3) of the receiver when the infrared remote control is activated?
NO
Replace receiver.
YES
Check between at pin (1) of receiver and all the way up thru pin (15) of IC801.
NO
Replace IC801.

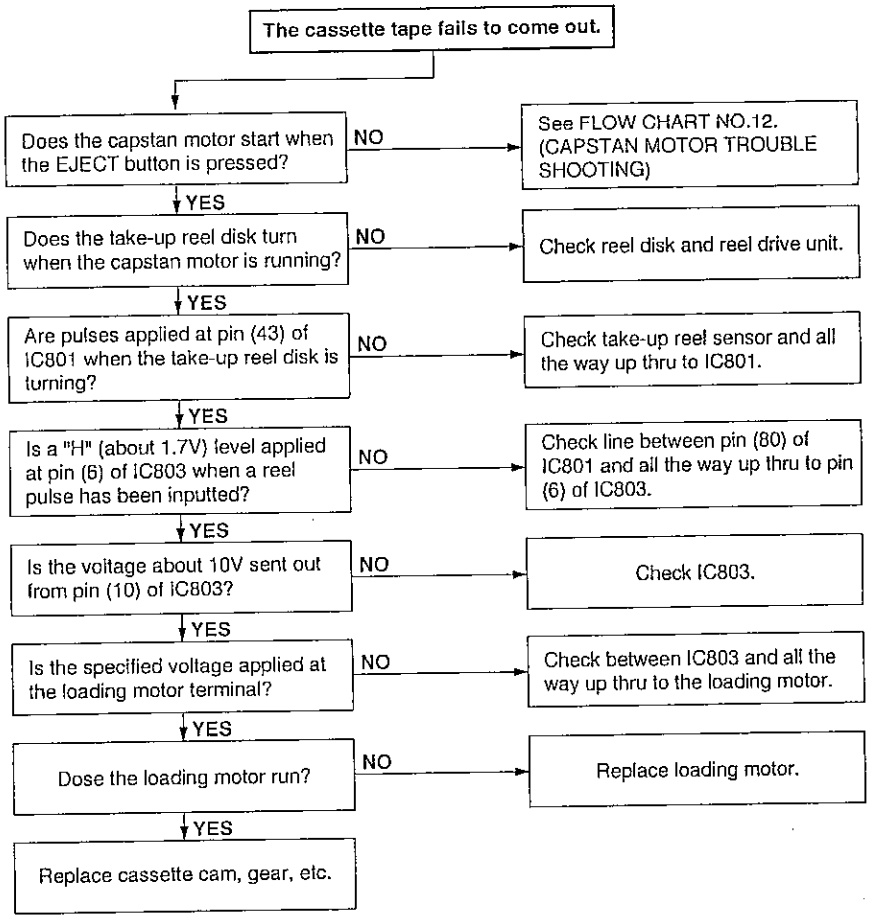
FLOW CHART NO.8 CASSETTE CONTROL TROUBLESHOOTING(1)


A cassette tape is not take in.
Is the cassette housing distroted?
YES
Fix or replace the cassette housing.
NO
Does the start sensor cover go to open when the cassette tape is inserted?
NO
Check start sensor cover.
YES
Does pin (71) of IC801 change from "H" to "L" level when the cassette tape is inserted?
NO
Check start sensor and all the way up thru to pin (71) of IC801.
YES
Does pin (5) of IC803 go to a "H" (about 0.7V) level when the cassette tape is inserted?
NO
Check line between pin (81) of IC801 and all the way up thru to pin (5) of IC803.
YES
Does pin (2) of IC803 change to about 10V when the cassette tape is inserted?
NO
Check IC803.
YES
Is the specified voltage applied at the loading motor terminal when the casette tape is inserted?
NO
Check between IC803 and all the way up thru to loading motor.
YES
Replace loading motor.

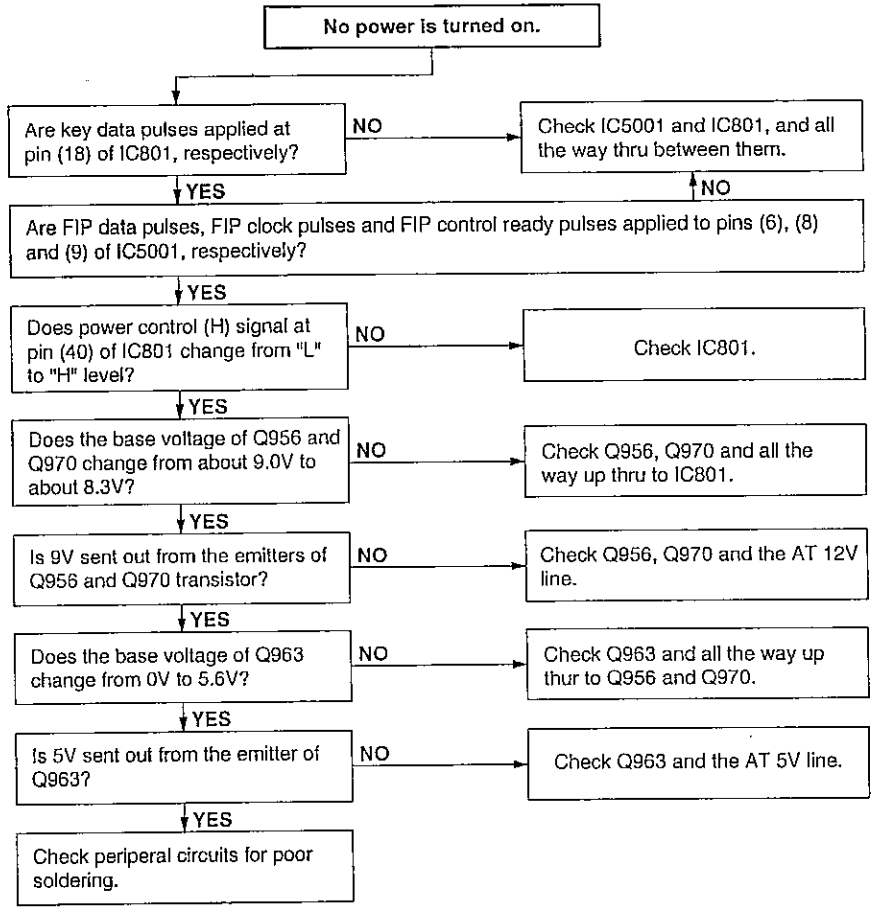
FLOW CHART NO.9 CASSETTE CONTROL TROUBLESHOOTING (2)


A cassette tape is taken in, but ejected at once.
Does the start sensor pulse at pin (71) of IC801 change from "L" to "H" level when the cassette tape is loaded?
NO
Check start sensor and all the way up thru to IC801.
YES
Does the end sensor pulse at pin (72) of IC801 change from "L" to a "H" level when the cassette tape is loaded?
NO
Check end sensor and all the way up thru to IC801.
YES
Does the master cam mode shifter operate normally when the cassette tape is loaded?
NO
Check cam switch and all the way up thru to IC801.
YES
Replace IC801.

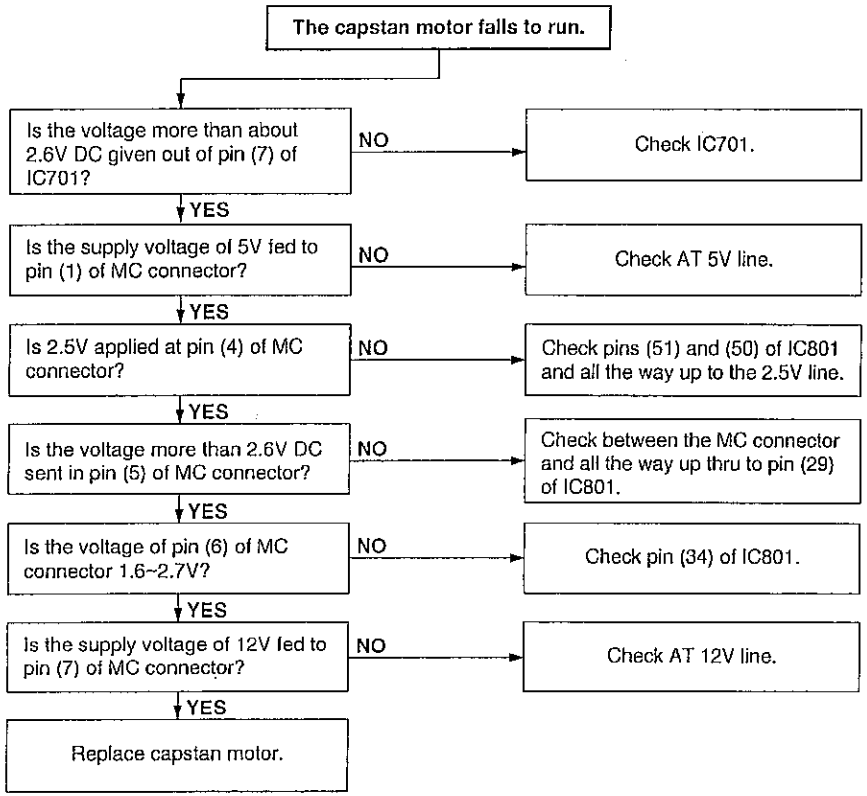
FLOW CHART NO.10 LOADING MOTOR AND EJECT TROUBLESHOOTING


The cassette tape fails to come out.
Does the capstan motor start when the EJECT button is pressed?
NO
See FLOW CHART NO.12. (CAPSTAN MOTOR TROUBLE SHOOTING)
YES
Does the take-up reel disk turn when the capstan motor is running?
NO
Check reel disk and reel drive unit.
YES
Are pulses applied at pin (43) of IC801 when the take-up reel disk is turning?
NO
Check take-up reel sensor and all the way up thru to IC801.
YES
Is a "H" (about 1.7V) level applied at pin (6) of IC803 when a reel pulse has been inputted?
NO
Check line between pin (80) of IC801 and all the way up thru to pin (6) of IC803.
YES
Is the voltage about 10V sent out from pin (10) of IC803?
NO
Check IC803.
YES
Is the specified voltage applied at the loading motor terminal?
NO
Check between IC803 and all the way up thru to the loading motor.
YES
Dose the loading motor run?
NO
Replace loading motor.
YES
Replace cassette cam, gear, etc.

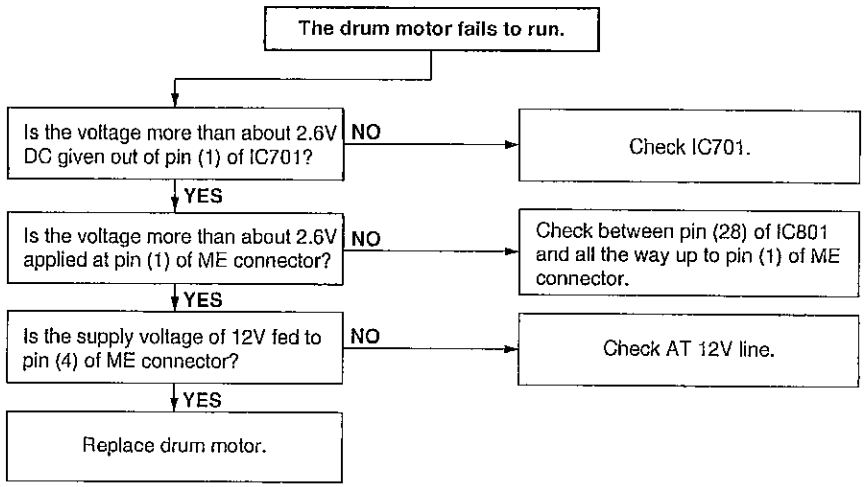
FLOW CHART NO.11 SYSTEM CONTROL TROUBLESHOOTING


No power is turned on.
Are key data pulses applied at pin (18) of IC801, respectively?
NO
Check IC5001 and IC801, and all the way thru between them.
YES
NO
Are FIP data pulses, FIP clock pulses and FIP control ready pulses applied to pins (6), (8) and (9) of IC5001, respectively?
YES
Does power control (H) signal at pin (40) of IC801 change from "L" to "H" level?
NO
Check IC801.
YES
Does the base voltage of Q956 and Q970 change from about 9.0V to about 8.3V?
NO
Check Q956, Q970 and all the way up thru to IC801.
YES
Is 9V sent out from the emitters of Q956 and Q970 transistor?
NO
Check Q956, Q970 and the AT 12V line.
YES
Does the base voltage of Q963 change from 0V to 5.6V?
NO
Check Q963 and all the way up thur to Q956 and Q970.
YES
Is 5V sent out from the emitter of Q963?
NO
Check Q963 and the AT 5V line.
YES
Check peripheral circuits for poor soldering.

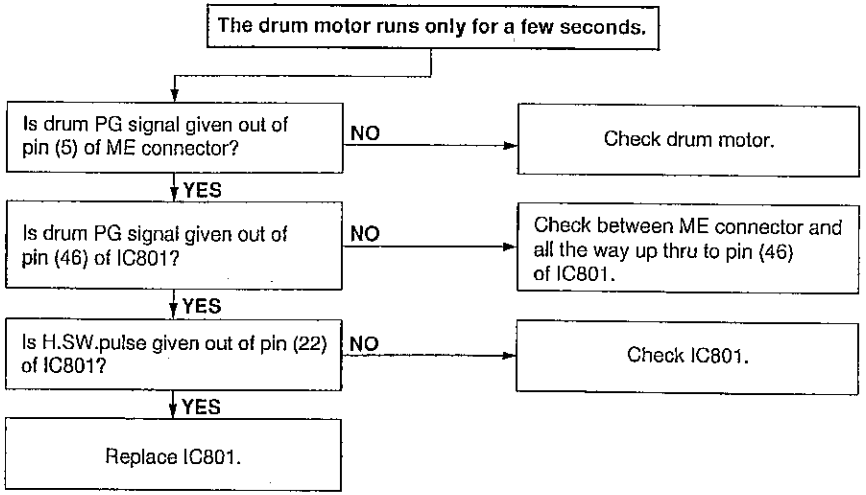
FLOW CHART NO.12 CAPSTAN MOTOR TROUBLESHOOTING


The capstan motor falls to run.
Is the voltage more than about 2.6V DC given out of pin (7) of IC701?
NO
Check IC701.
YES
Is the supply voltage of 5V fed to pin (1) of MC connector?
NO
Check AT 5V line.
YES
Is 2.5V applied at pin (4) of MC connector?
NO
Check pins (51) and (50) of IC801 and all the way up to the 2.5V line.
YES
Is the voltage more than 2.6V DC sent in pin (5) of MC connector?
NO
Check between the MC connector and all the way up thru to pin (29) of IC801.
YES
Is the voltage of pin (6) of MC connector 1.6~2.7V?
NO
Check pin (34) of IC801.
YES
Is the supply voltage of 12V fed to pin (7) of MC connector?
NO
Check AT 12V line.
YES
Replace capstan motor.

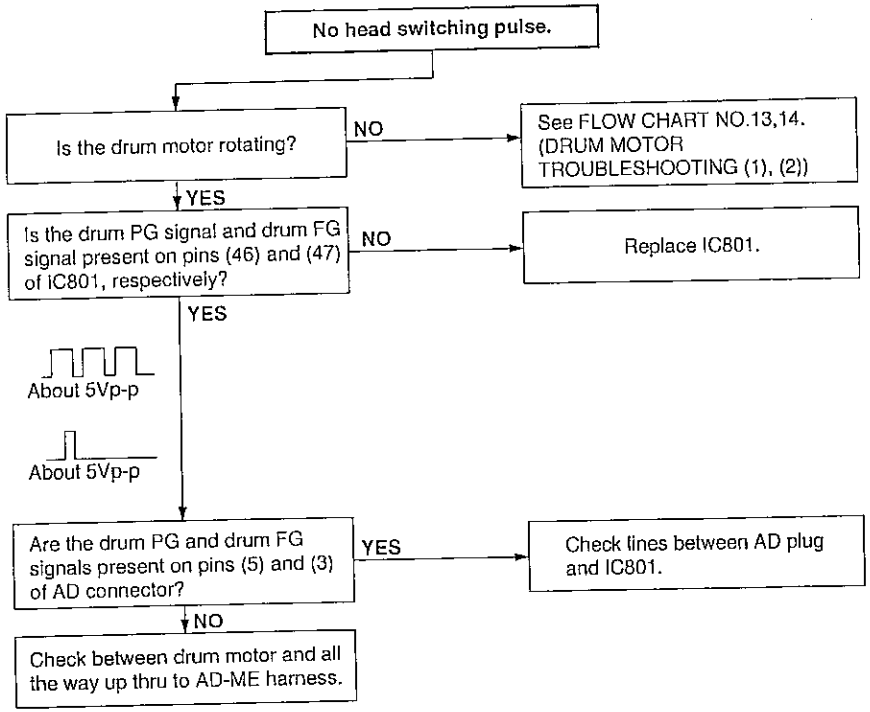
FLOW CHART NO.13 DRUM MOTOR TROUBLESHOOTING (1)


The drum motor fails to run.
Is the voltage more than about 2.6V DC given out of pin (1) of IC701?
NO
Check IC701.
YES
Is the voltage more than about 2.6V applied at pin (1) of ME connector?
NO
Check between pin (28) of IC801 and all the way up to pin (1) of ME connector.
YES
Is the supply voltage of 12V fed to pin (4) of ME connector?
NO
Check AT 12V line.
YES
Replace drum motor.

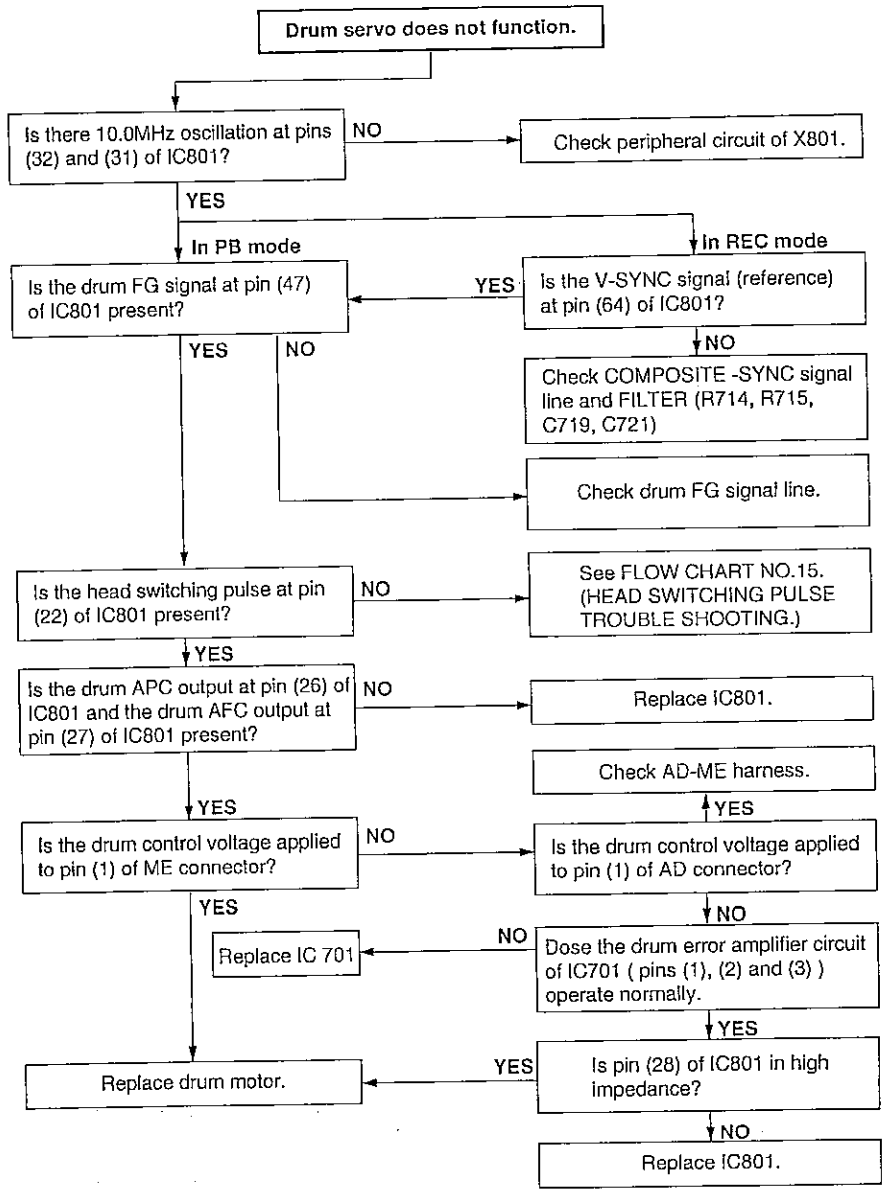
FLOW CHART NO.14 DRUM MOTOR TROUBLESHOOTING (2)


The drum motor runs only for a few seconds.
Is drum PG signal given out of pin (5) of ME connector?
NO
Check drum motor.
YES
Is drum PG signal given out of pin (46) of IC801?
NO
Check between ME connector and all the way up thru to pin (46) of IC801.
YES
Is H.SW.pulse given out of pin (22) of IC801?
NO
Check IC801.
YES
Replace IC801.

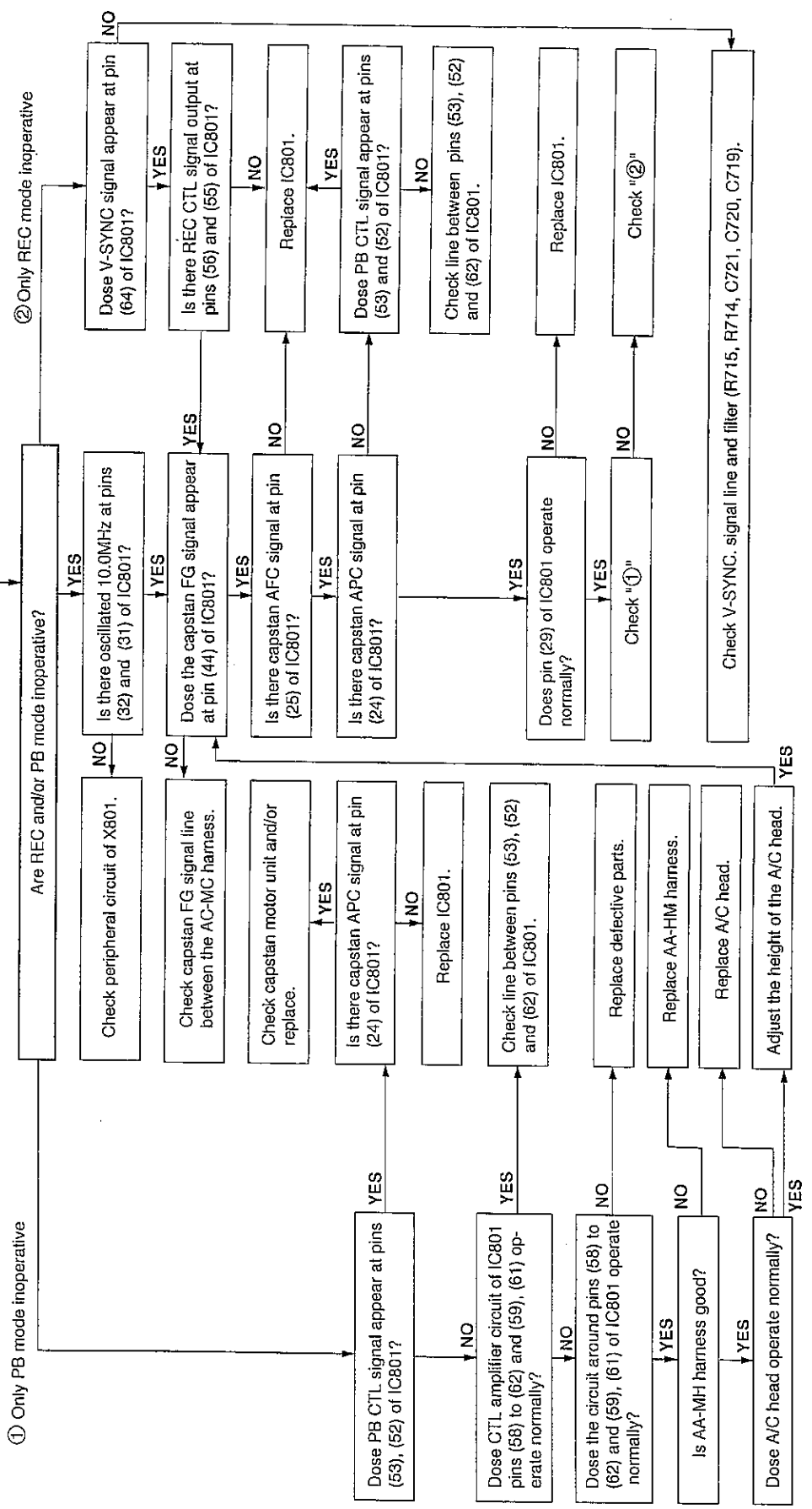
FLOW CHART NO.15 HEAD SWITCHING PULSE TROUBLESHOOTING.


No head switching pulse.
Is the drum motor rotating?
NO
See FLOW CHART NO.13,14. (DRUM MOTOR TROUBLESHOOTING (1), (2))
YES
Is the drum PG signal and drum FG signal present on pins (46) and (47) of IC801, respectively?
NO
Replace IC801.
YES
About 5Vp-p
About 5Vp-p
Are the drum PG and drum FG signals present on pins (5) and (3) of AD connector?
YES
Check lines between AD plug and IC801.
NO
Check between drum motor and all the way up thru to AD-ME harness.

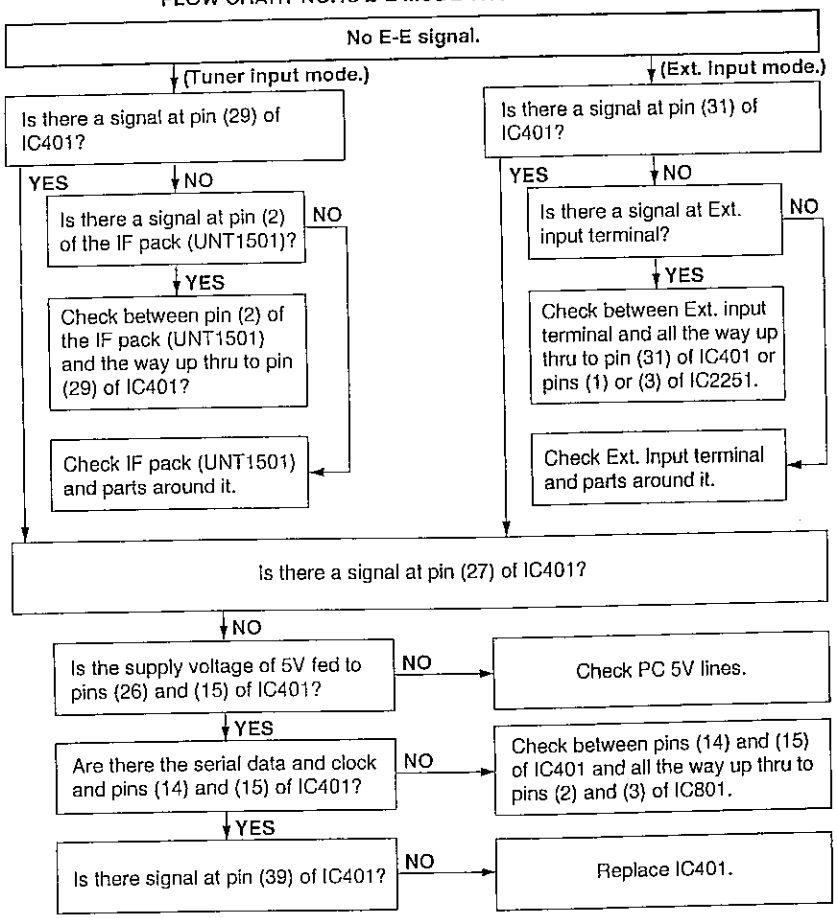
FLOW CHART NO.16 DRUM SERVO TROUBLESHOOTING


Drum servo does not function.
Is there 10.0MHz oscillation at pins (32) and (31) of IC801?
NO
Check peripheral circuit of X801.
YES
In PB mode
In REC mode
Is the drum FG signal at pin (47) of IC801 present?
YES
Is the V-SYNC signal (reference) at pin (64) of IC801?
YES
NO
NO
Check COMPOSITE -SYNC signal line and FILTER (R714, R715, C719, C721)
Check drum FG signal line.
Is the head switching pulse at pin (22) of IC801 present?
NO
See FLOW CHART NO.15. (HEAD SWITCHING PULSE TROUBLE SHOOTING.)
YES
Is the drum APC output at pin (26) of IC801 and the drum AFC output at pin (27) of IC801 present?
NO
Replace IC801.
Check AD-ME harness.
YES
YES
Is the drum control voltage applied to pin (1) of ME connector?
NO
Is the drum control voltage applied to pin (1) of AD connector?
YES
NO
Replace IC 701
NO
Dose the drum error amplifier circuit of IC701 (pins (1), (2) and (3)) operate normally.
YES
Replace drum motor.
YES
Is pin (28) of IC801 in high impedance?
NO
Replace IC801.

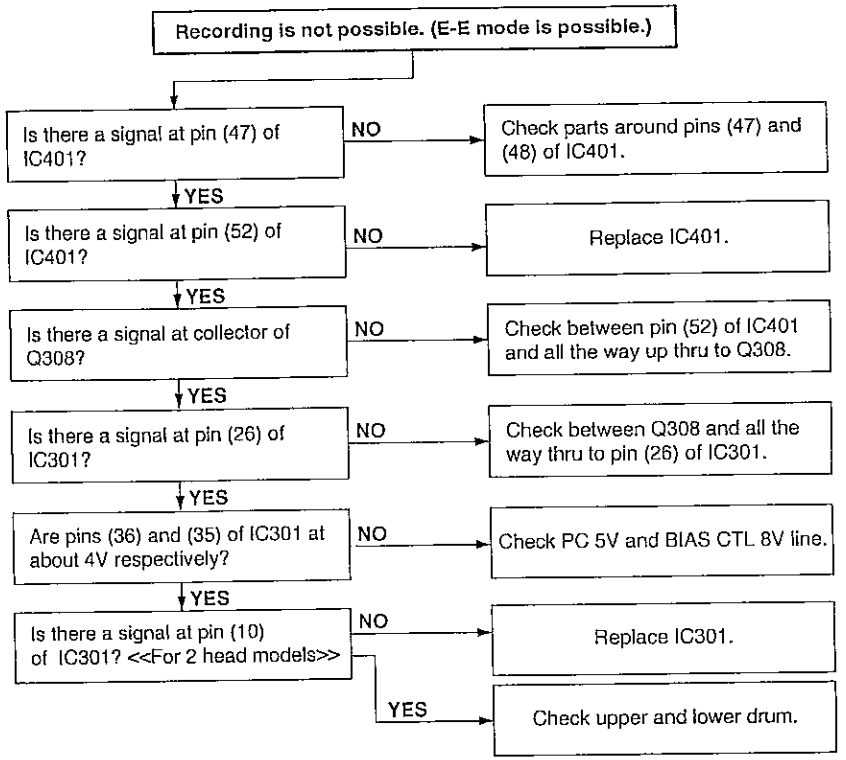
FLOW CHART NO.17 SYSTEM CONTROL SERVO TROUBLESHOOTING


Capstan servo dose not function.
Are REC and/or PB mode inoperative?
① Only PB mode inoperative
② Only REC mode inoperative
YES
NO
Is there oscillated 10.0MHz at pins (32) and (31) of IC801?
Check peripheral circuit of X801.
Dose the capstan FG signal appear at pin (44) of IC801?
Check capstan FG signal line between the AC-MC harness.
Is there capstan AFC signal at pin (25) of IC801?
Check capstan motor unit and/or replace.
Is there capstan APC signal at pin (24) of IC801?
Replace IC801.
Dose V-SYNC signal appear at pin (64) of IC801?
Is there REC CTL signal output at pins (56) and (55) of IC801?
Replace IC801.
Dose PB CTL signal appear at pins (53) and (52) of IC801?
Check line between pins (53), (52) and (62) of IC801.
Is there capstan APC signal at pin (24) of IC801?
Does pin (29) of IC801 operate normally?
Replace IC801.
Check "①"
Check "②"
Check V-SYNC. signal line and filter (R715, R714, C721, C720, C719).
Dose PB CTL signal appear at pins (53), (52) of IC801?
Check line between pins (53), (52) and (62) of IC801.
Dose CTL amplifier circuit of IC801 pins (58) to (62) and (59), (61) operate normally?
Replace defective parts.
Dose the circuit around pins (58) to (62) and (59), (61) of IC801 operate normally?
Replace AA-HM harness.
Is AA-MH harness good?
Replace A/C head.
Dose A/C head operate normally?
Adjust the height of the A/C head.

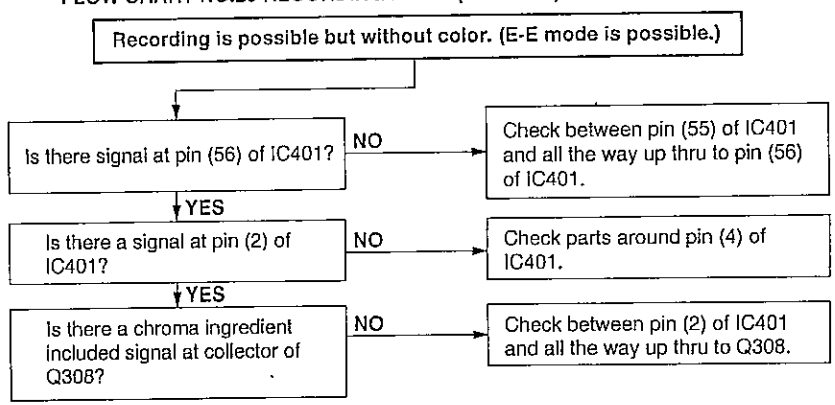
FLOW CHART NO.18 E-E MODE TROUBLESHOOTING


No E-E signal.
(Tuner input mode.)
(Ext. Input mode.)
Is there a signal at pin (29) of IC401?
Is there a signal at pin (31) of IC401?
YES
NO
Is there a signal at pin (2) of the IF pack (UNT1501)?
NO
YES
Check between pin (2) of the IF pack (UNT1501) and the way up thru to pin (29) of IC401?
Check IF pack (UNT1501) and parts around it.
Is there a signal at Ext. input terminal?
NO
YES
Check between Ext. input terminal and all the way up thru to pin (31) of IC401 or pins (1) or (3) of IC2251.
Check Ext. Input terminal and parts around it.
Is there a signal at pin (27) of IC401?
NO
Is the supply voltage of 5V fed to pins (26) and (15) of IC401?
NO
Check PC 5V lines.
YES
Are there the serial data and clock and pins (14) and (15) of IC401?
NO
Check between pins (14) and (15) of IC401 and all the way up thru to pins (2) and (3) of IC801.
YES
Is there signal at pin (39) of IC401?
NO
Replace IC401.

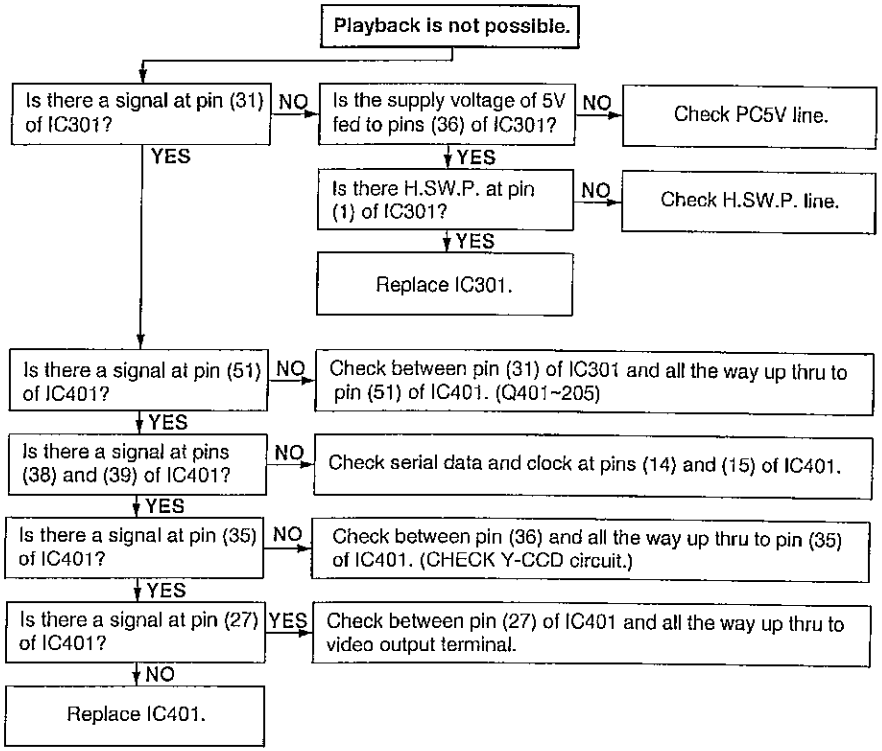
FLOW CHART NO.19 RECORDING MODE (LUMINANCE) TROUBLESHOOTING


Recording is not possible. (E-E mode is possible.)
Is there a signal at pin (47) of IC401?
NO
Check parts around pins (47) and (48) of IC401.
YES
Is there a signal at pin (52) of IC401?
NO
Replace IC401.
YES
Is there a signal at collector of Q308?
NO
Check between pin (52) of IC401 and all the way up thru to Q308.
YES
Is there a signal at pin (26) of IC301?
NO
Check between Q308 and all the way thru to pin (26) of IC301.
YES
Are pins (36) and (35) of IC301 at about 4V respectively?
NO
Check PC 5V and BIAS CTL 8V line.
YES
Is there a signal at pin (10) of IC301? <<For 2 head models>>
NO
Replace IC301.
YES
Check upper and lower drum.

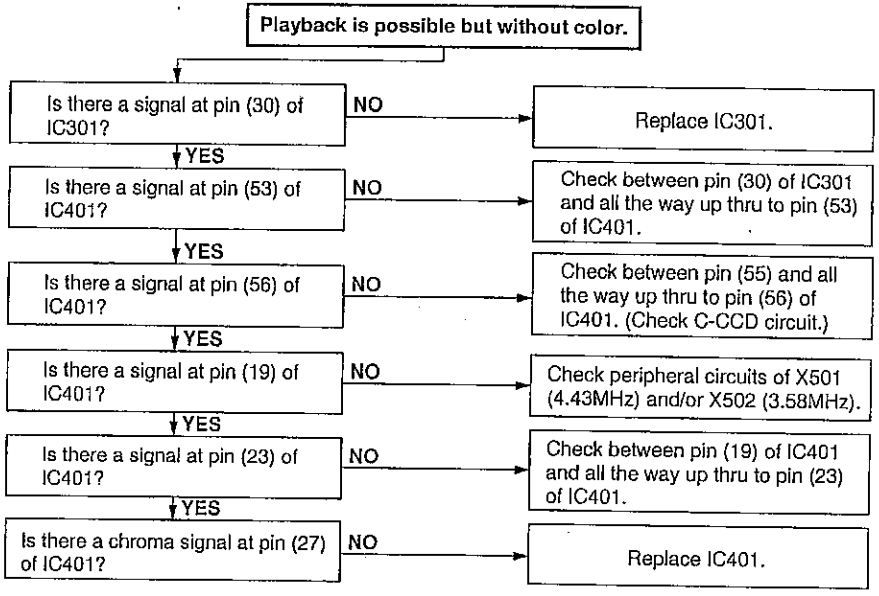
FLOW CHART NO.20 RECORDING MODE (CHROMA) TROUBLESHOOTING


Recording is possible but without color. (E-E mode is possible.)
Is there signal at pin (56) of IC401?
NO
Check between pin (55) of IC401 and all the way up thru to pin (56) of IC401.
YES
Is there a signal at pin (2) of IC401?
NO
Check parts around pin (4) of IC401.
YES
Is there a chroma ingredient included signal at collector of Q308?
NO
Check between pin (2) of IC401 and all the way up thru to Q308.

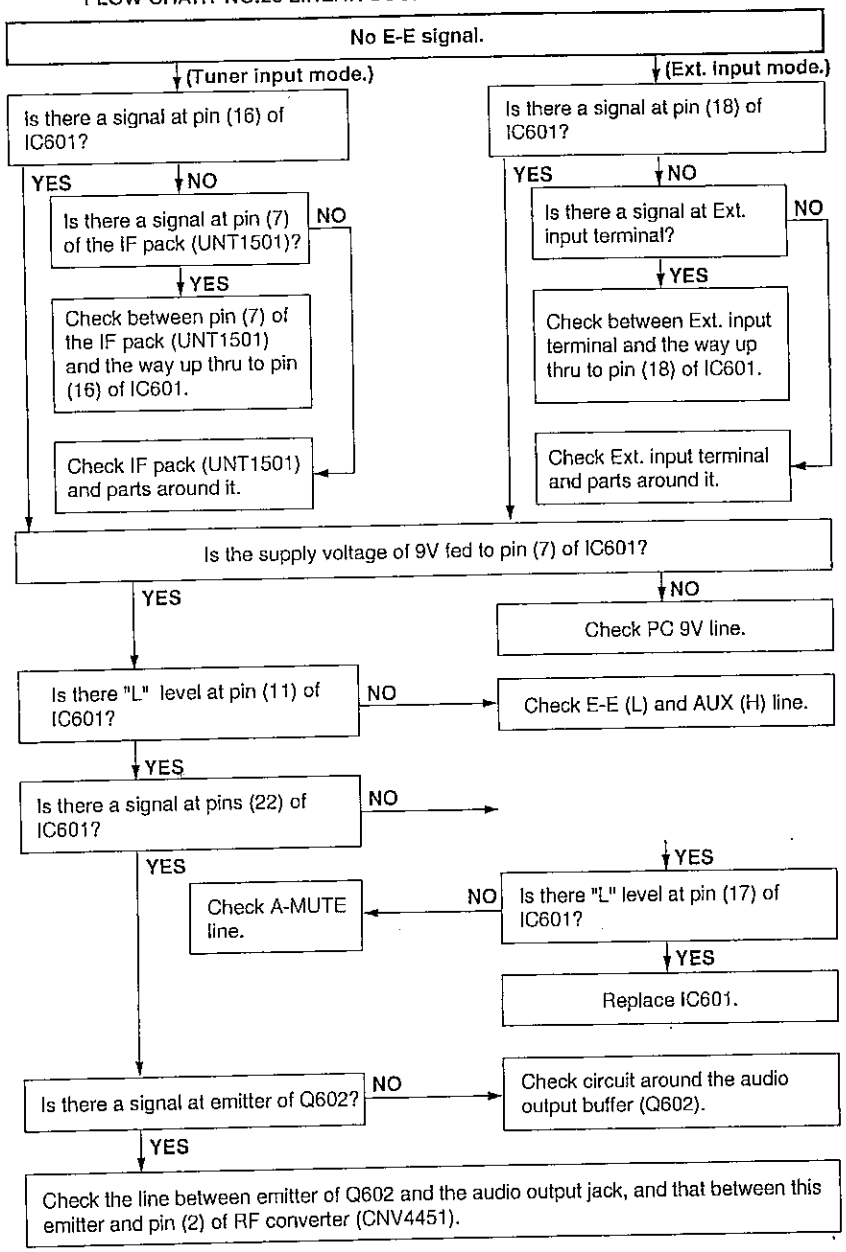
FLOW CHART NO.21 PLAYBACK MODE (LUMINANCE) TROUBLESHOOTING


Playback is not possible.
Is there a signal at pin (31) of IC301?
NO
Is the supply voltage of 5V fed to pins (36) of IC301?
NO
Check PC5V line.
YES
Is there H.SW.P. at pin (1) of IC301?
NO
Check H.SW.P. line.
YES
Replace IC301.
YES
Is there a signal at pin (51) of IC401?
NO
Check between pin (31) of IC301 and all the way up thru to pin (51) of IC401. (Q401~205)
YES
Is there a signal at pins (38) and (39) of IC401?
NO
Check serial data and clock at pins (14) and (15) of IC401.
YES
Is there a signal at pin (35) of IC401?
NO
Check between pin (36) and all the way up thru to pin (35) of IC401. (CHECK Y-CCD circuit.)
YES
Is there a signal at pin (27) of IC401?
YES
Check between pin (27) of IC401 and all the way up thru to video output terminal.
NO
Replace IC401.

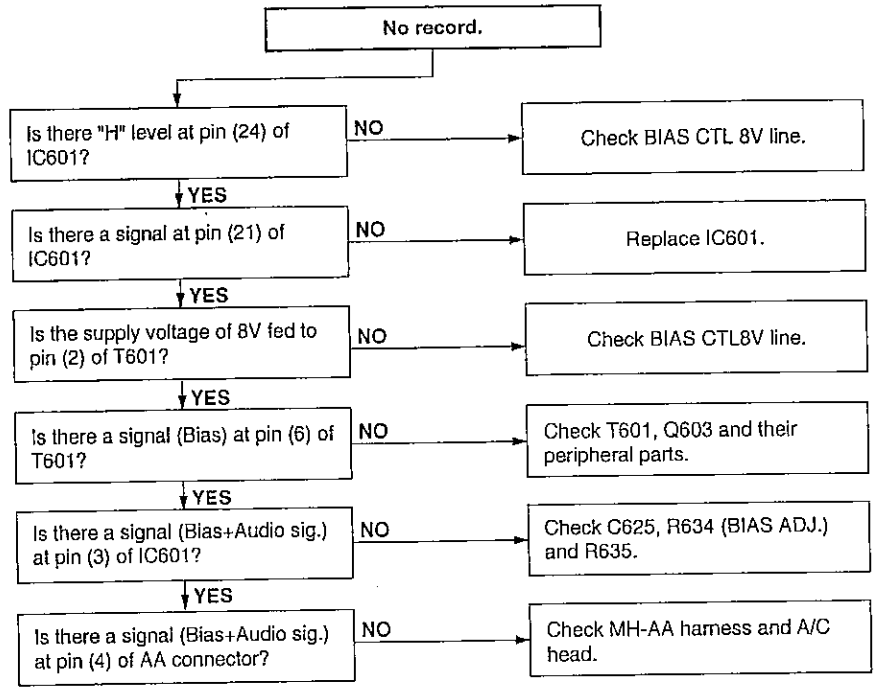
FLOW CHART NO.22 PLAYBACK MODE (CHROMA) TROUBLESHOOTING


Playback is possible but without color.
Is there a signal at pin (30) of IC301?
NO
Replace IC301.
YES
Is there a signal at pin (53) of IC401?
NO
Check between pin (30) of IC301 and all the way up thru to pin (53) of IC401.
YES
Is there a signal at pin (56) of IC401?
NO
Check between pin (55) and all the way up thru to pin (56) of IC401. (Check C-CCD circuit.)
YES
Is there a signal at pin (19) of IC401?
NO
Check peripheral circuits of X501 (4.43MHz) and/or X502 (3.58MHz).
YES
Is there a signal at pin (23) of IC401?
NO
Check between pin (19) of IC401 and all the way up thru to pin (23) of IC401.
YES
Is there a chroma signal at pin (27) of IC401?
NO
Replace IC401.

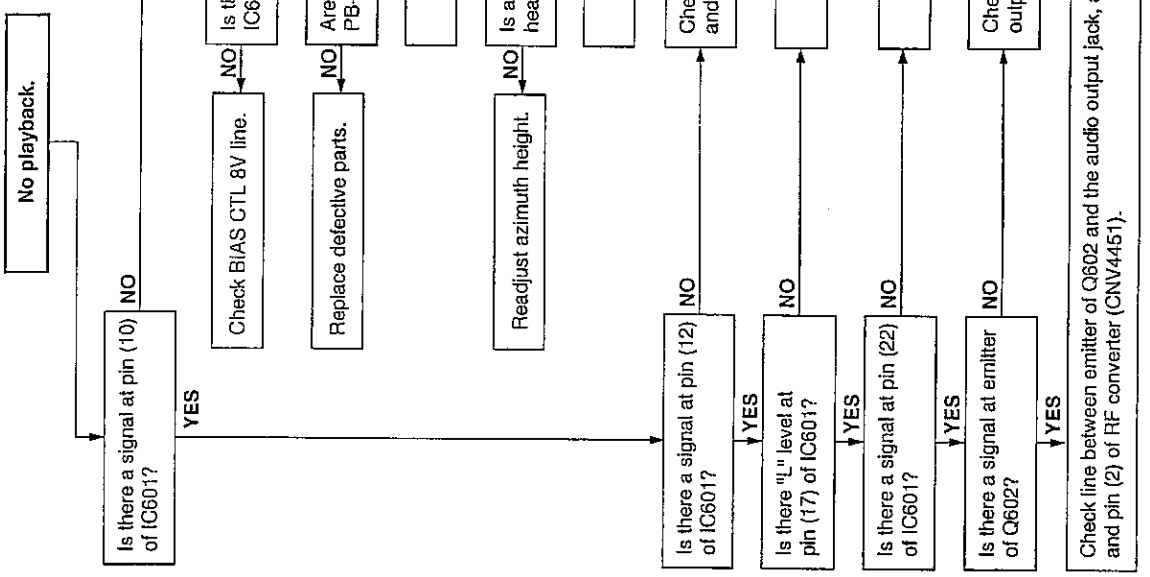
FLOW CHART NO.23 LINEAR SOUND E-E MODE TROUBLESHOOTING


No E-E signal.
(Tuner input mode.)
(Ext. input mode.)
Is there a signal at pin (16) of IC601?
Is there a signal at pin (18) of IC601?
YES
NO
Is there a signal at pin (7) of the IF pack (UNT1501)?
Is there a signal at Ext. input terminal?
Check between pin (7) of the IF pack (UNT1501) and the way up thru to pin (16) of IC601.
Check between Ext. input terminal and the way up thru to pin (18) of IC601.
Check IF pack (UNT1501) and parts around it.
Check Ext. input terminal and parts around it.
Is the supply voltage of 9V fed to pin (7) of IC601?
Check PC 9V line.
Is there "L" level at pin (11) of IC601?
Check E-E (L) and AUX (H) line.
Is there a signal at pins (22) of IC601?
Is there "L" level at pin (17) of IC601?
Check A-MUTE line.
Replace IC601.
Is there a signal at emitter of Q602?
Check circuit around the audio output buffer (Q602).
Check the line between emitter of Q602 and the audio output jack, and that between this emitter and pin (2) of RF converter (CNV4451).

FLOW CHART NO.24 LINEAR SOUND RECORDING MODE TROUBLESHOOTING


No record.
Is there "H" level at pin (24) of IC601?
Check BIAS CTL 8V line.
Is there a signal at pin (21) of IC601?
Replace IC601.
Is the supply voltage of 8V fed to pin (2) of T601?
Check BIAS CTL8V line.
Is there a signal (Bias) at pin (6) of T601?
Check T601, Q603 and their peripheral parts.
Is there a signal (Bias+Audio sig.) at pin (3) of IC601?
Check C625, R634 (BIAS ADJ.) and R635.
Is there a signal (Bias+Audio sig.) at pin (4) of AA connector?
Check MH-AA harness and A/C head.

FLOW CHART NO.25 LINEAR SOUND PLAYBACK MODE TROUBLESHOOTING


No playback.
Is there a signal at pin (10) of IC601?
NO
YES
Is there "L" level at pin (24) of IC601?
NO
Check BIAS CTL 8V line.
YES
Are the MH-AA harness and the PB-AMP's peripheral parts normal?
NO
Replace defective parts.
YES
Clean A/C head.
Is azimuth height of the A/C head properly adjusted?
NO
Readjust azimuth height.
YES
Replace A/C head.
Is there a signal at pin (12) of IC601?
NO
Check circuits between pins (10) and (12) of IC601.
YES
Is there "L" level at pin (17) of IC601?
NO
Check AUDIO MUTE line.
YES
Is there a signal at pin (22) of IC601?
NO
Replace IC601.
YES
Is there a signal at emitter of Q602?
NO
Check circuit around the audio output buffer (Q602).
YES
Check line between emitter of Q602 and the audio output jack, and that between this emitter and pin (2) of RF converter (CNV4451).

REPLACEMENT OF IC804 (E²PROM)

«Servicing precautions»
When the IC804 (E²PROM) has been replaced, make the following reprogramming.
Depending on models, the IC804 (E²PROM) has been factory adjusted for it's memory function.
It's therefore necessary to reprogram the memory function for the model in question.
Note that the servo circuit requires readjustments for the slow and still modes.

Memory function reprogramming.

1. Check the power off. (power is standby mode)
2. Make for a moment short-circuited between TP5001 and TP5002, both located at the front side on the main PWB. Be sure that all the fluorescent display tubes light up into the TEST mode.
3. Using the CHANNEL (+) and (–) buttons, select the right function numbers from among JP0-JP31, which appear in the fluorescent display tube, referring to the E²PROM map.
   Press the DISPLAY button to pick up the functions (ON) and the CLEAR button to discard the functions (OFF).
   DISPLAY and CLEAR buttons, are located on the remote control unit.
   * When the DISPLAY button has been pressed (ON), the memory function No. starts flashing.
   * When the CLEAR button has been pressed (OFF), the memory function No. lights up.
4. Make a short-circuited between TP5003 and TP5004, both located at the front side on the main PWB, and the settings will be displayed in hexadecimal notation.
   Now you can see if the settings are correct.
5. Example: "ON" and "OFF" are taken as "1" and "0" respectively.
   The numbers JP0 to JP31 are divided into four groups and each group's setting is displayed in hexadecimal notation.

J31	J30	J29	J28	J27	J26	J25	J24	J23	J22	J21	J20	J19	J18	J17	J16
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	⇩				⇩				⇩				⇩		
	SPACE				0				0				0		

J15	J14	J13	J12	J11	J10	J09	J08	J07	J06	J05	J04	J03	J02	J01	J00
0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	1
	⇩				⇩				⇩				⇩		
	0				4				0				D		

   "000040D" appears in the fluorescent display tube.

6. Finally make for a moment short-circuited between TP5001 and TP5002, both located at the front side on the main PWB to clear the TEST mode or press the OPERATE button to turn the power on.

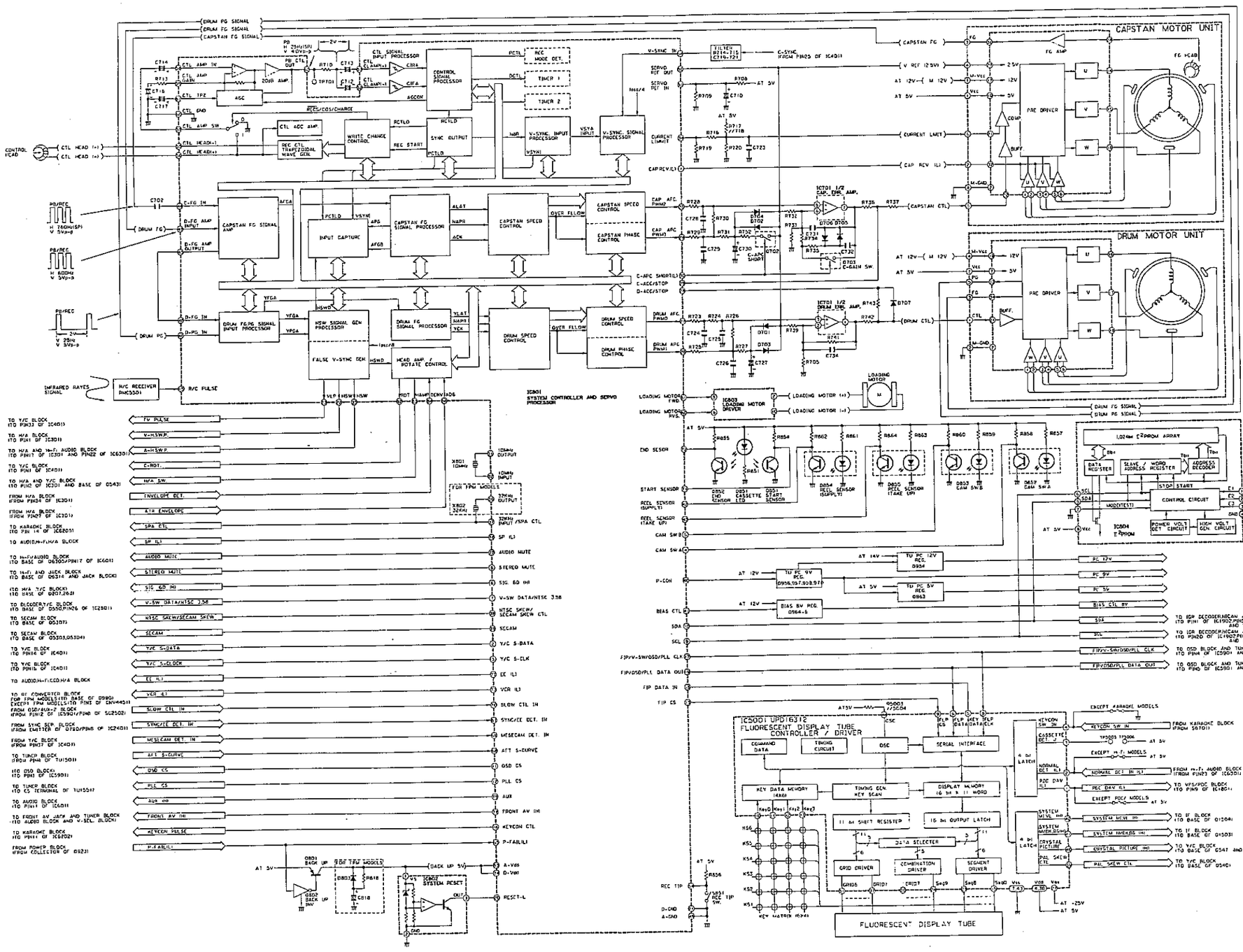
ROM MAP

MODELS		MA33	MA223	MA55	MA443	MA66W	MH71	MH99			A200X	A400X	A250X	A450X	H600X	H650X	A200NZ	A250NZ	A450NZ	H650NZ					
JP31	—	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0					
30	—	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0					
29	—	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0					
28	—	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0					
27	I-REPLAY	0	0	1	1	1	1	1			0	1	1	1	1	1	0	0	0	0					
26	NTSC SKEW	0	0	0	0	1	0	1			0	0	0	0	0	0	0	0	0	0					
25	HEAD 1	0	0	1	1	1	1	1			0	1	0	1	1	1	0	0	1	1					
24	HEAD 0	0	0	0	0	0	0	0			0	0	1	0	0	0	0	1	0	0					
23	Hi-Fi	0	0	0	0	0	1	1			0	0	0	0	1	1	0	0	0	1					
22	SORT/CLOCK	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0					
21	DECODER	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0					
20	S. PICTURE	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0					
19	NICAM 1	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	1					
18	NICAM 0	0	0	0	0	1	0	1			0	0	0	0	0	0	0	0	0	1					
17	G-CODE 1	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0					
16	G-CODE 0	0	0	0	0	0	0	1			0	0	1	1	0	1	0	1	1	1					
15	OEM	1	1	1	1	1	1	1			0	0	0	0	0	0	0	0	0	0					
14	LP	0	0	1	1	1	1	1			0	0	1	1	1	1	0	1	1	1					
13	F-AV	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0					
12	2 SCART	0	0	0	0	0	1	1			0	0	0	1	1	1	0	0	1	1					
11	CATV	1	1	1	1	1	1	1			0	0	0	0	0	0	0	0	0	0					
10	TUNER 2	1	1	1	1	1	1	1			0	0	0	0	0	0	0	0	0	0					
9	TUNER 1	1	1	1	1	1	1	1			0	0	0	0	0	0	1	1	1	1					
8	TUNER 0	0	0	0	0	0	0	0			1	1	1	1	1	1	0	0	0	0					
7	SYSTEM 1	1	1	1	1	1	1	1			0	0	0	0	0	0	0	0	0	0					
6	SYSTEM 0	0	0	0	0	1	0	1			0	0	0	0	0	0	0	0	0	0					
5	VCR 1	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0					
4	VCR 0	0	0	0	0	0	0	0			0	0	0	0	0	0	1	1	1	1					
3	SPETIALIZE	0	0	0	0	0	1	1			0	0	0	0	0	0	0	0	0	0					
2	VPS/PDC	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	1					
1	COLOR 1	0	1	0	1	0	0	0			0	0	0	0	0	0	0	0	0	1					
0	COLOR 0	0	1	0	1	0	0	0			0	0	0	0	0	0	0	0	0	0					
DISPLAY		0008E80	0008E83	A00CE80	A00CE83	C04CEC0	A80EE88	E85EEC8			0000100	A004100	9004100	A005100	A805100	A815100	0000210	1014210	2015210	28D5210					

(Note: "1" : flashing "0" : lights up)

8. BLOCK DIAGRAMS 电路方框图

SERVO BLOCK DIAGRAM 伺服电路方框图



SIGNAL FLOW BLOCK DIAGRAM
信号流程方框图

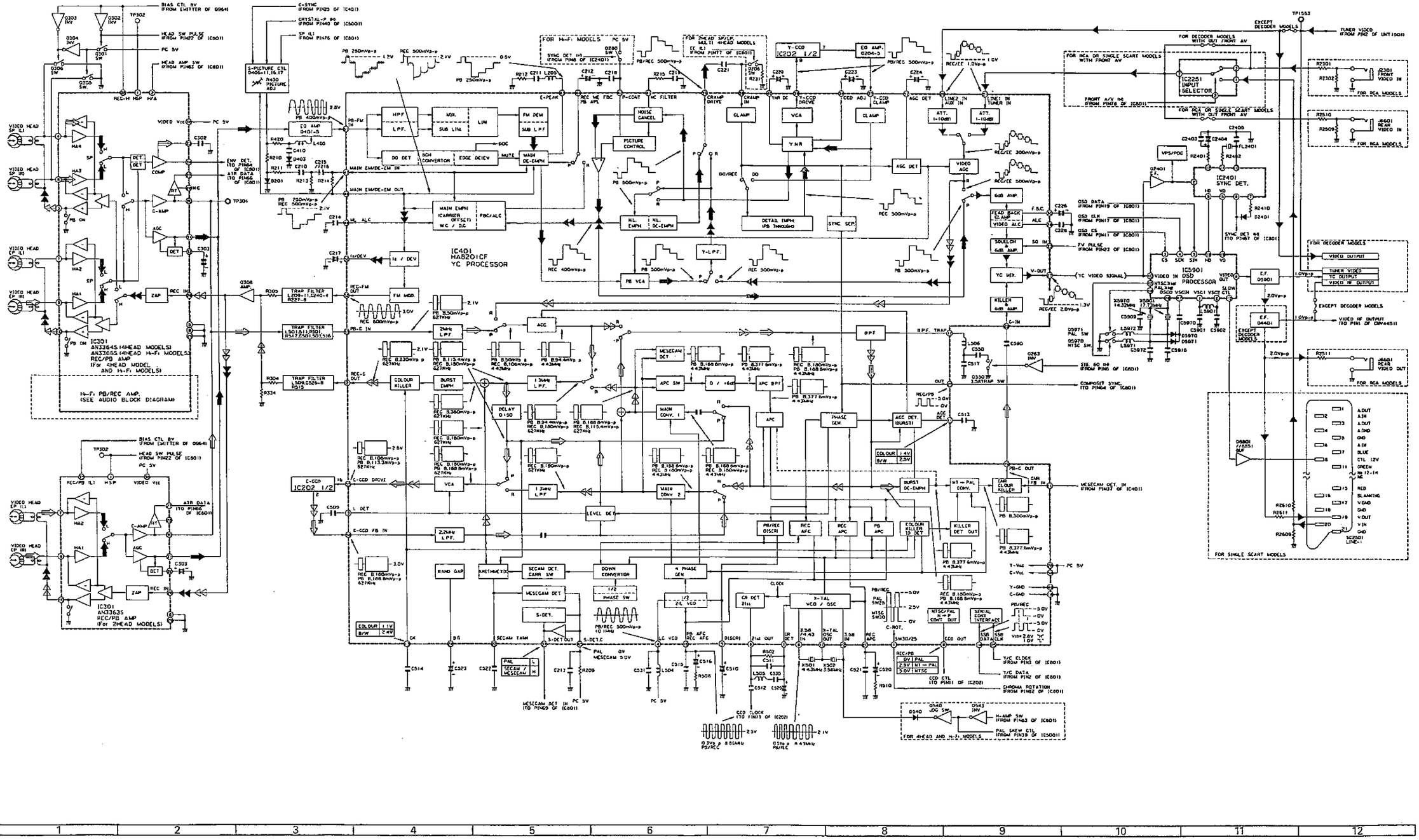
⇨ PB CHROMINANCE SIGNAL
再现色度信号

⇨⇨ REC CHROMINANCE SIGNAL
记录色度信号

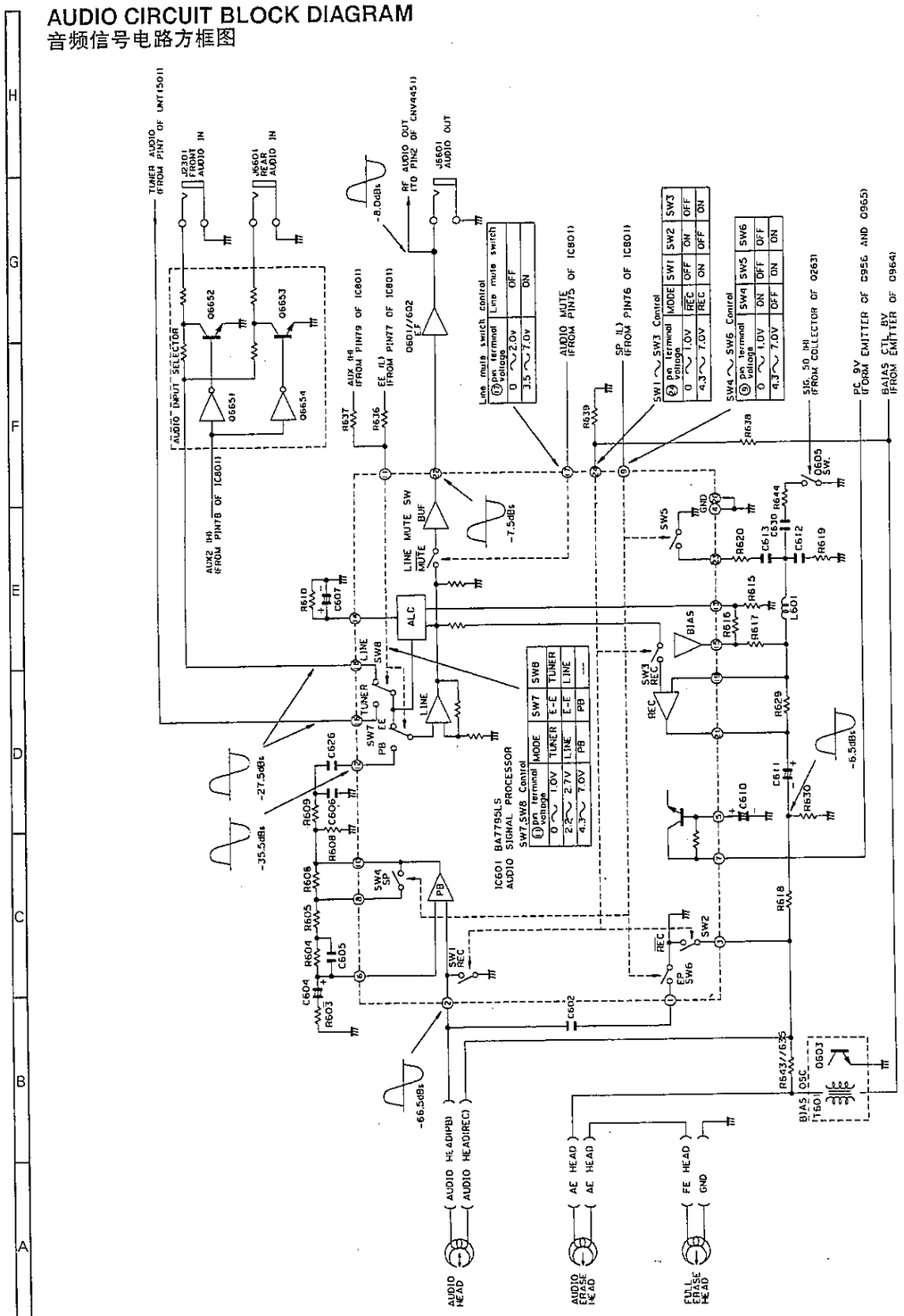
➡ PB LUMINANCE SIGNAL
再现亮度信号

➡➡ REC LUMINANCE SIGNAL
记录亮度信号

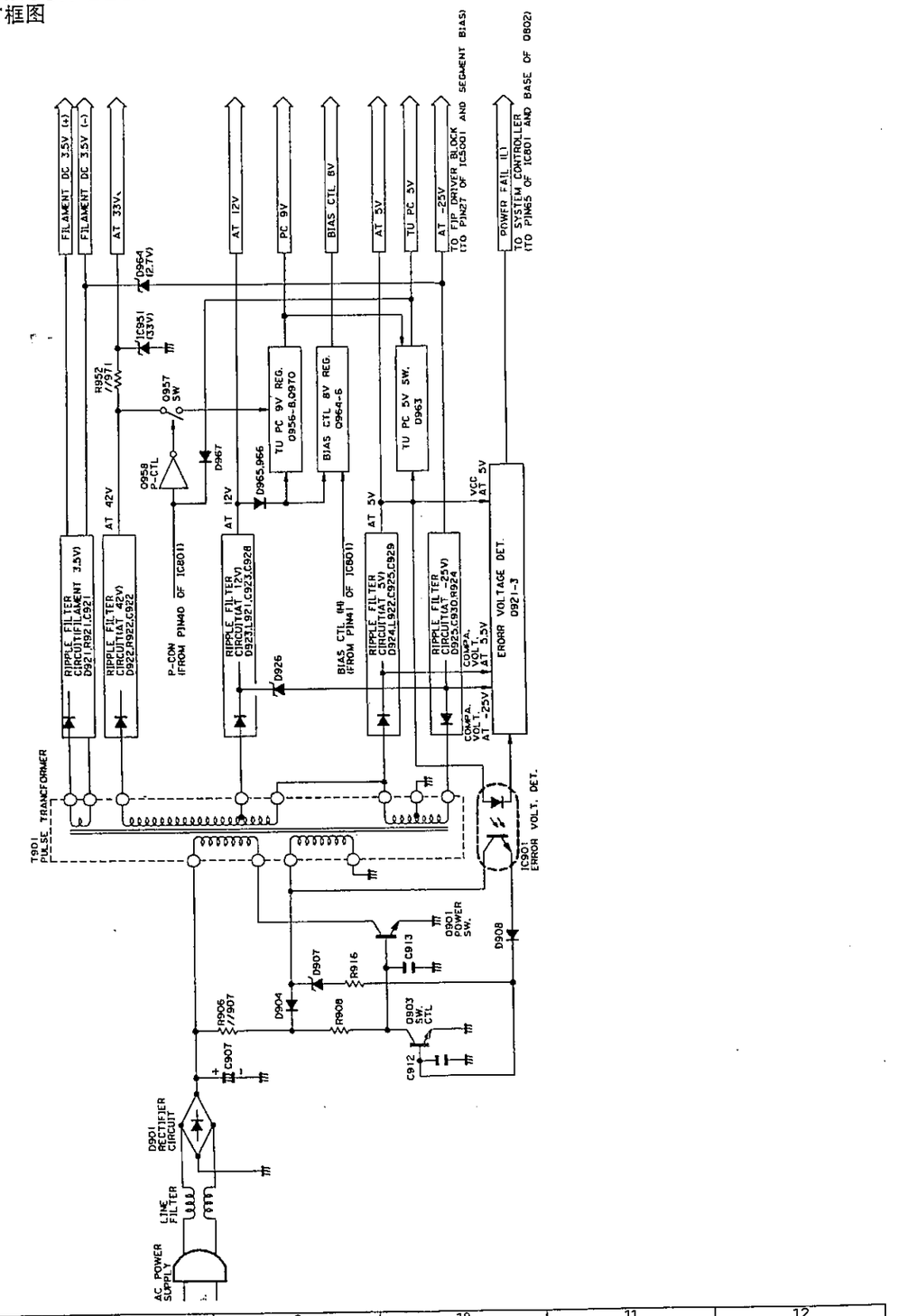
▶ E-E SIGNAL
E-E信号



AUDIO CIRCUIT BLOCK DIAGRAM
音频信号电路方框图



POWER CIRCUIT BLOCK DIAGRAM
电源电路方框图



VC-MA33, VC-MA55,
VC-MA223, VC-MA443

MEMO

SCHEMATIC DIAGRAM

电路原理图

IMPORTANT SAFETY NOTICE:
BE SURE TO USE GENUINE PARTS FOR SECURING THE SAFETY AND RELIABILITY OF THE SET.
PARTS MARKED WITH "⚠" AND PARTS SHADED (IN BLACK) ARE ESPECIALLY IMPORTANT FOR MAINTAINING THE SAFETY AND PROTECTING ABILITY OF THE SET.
BE SURE TO REPLACE THEM WITH PARTS OF SPECIFIED PART NUMBER.

安全使用注意要点：
为了保证本装置的安全性及可靠性，务请使用该型号装置的原配零件。
注有 ⚠ 标记，以及打有黑色阴影线的部分，对于保护本装置的安全，保持其使用性能及使用寿命极其重要。
更换这些部件时，务请使用规定编号者。

SAFETY NOTES:
1. *DISCONNECT THE AC PLUG FROM THE AC OUTLET BEFORE REPLACING PARTS.*
2. *SEMICONDUCTOR HEAT SINKS SHOULD BE REGARDED AS POTENTIOL SHOCK HAZARDS WHEN THE CHASSIS IS OPERATING.*

安全使用注意事项：
1.在进行部件更换之前，务请拔出电源插头。
2.本装置工作时，机芯底盘的半导体散热片有触电之滤，务请注意。

NOTES:
1. *The unit of resistance "ohm" is omitted (k=1000 ohm, M=1 Meg ohm).*
2. *All resistors are 1/8 watt, unless otherwise noted.*
3. *The unit of capacitance "F" is omitted (μ=μF, p=μμF).*
4. *The values in parentheses are the ones in the PB mode; the values without parentheses are the ones in the REC mode.*

VOLTAGE MEASUREMENT CONDITIONS:
1. *DC voltages are measured between points indicated and chassis ground by VTVM, with AC230V/ 50Hz supplied to unit and all controls are set to normal viewing picture unless otherwise noted.*
2. *Voltages are measured with 10000μV B & W or colour noted.*

WAVEFORM MEASUREMENT CONDITIONS:
10000μV 87.5 percent modulated colour bar signal is fed into tuner.

电路单位说明：
1.电阻“欧姆”(Ω)单位予以略记(K=千欧，M=兆欧姆)。
2.除特别说明者外，图中电阻功率均为1/16瓦特。
3.电容“法拉”(F)单位予以略记(μ=微法拉，P=微微法拉)。
4.在括弧内的数值为PB状态，无括弧的数值为REC状态。
电压测定条件
1.除特别说明者外，直流电压是以AC110～240V，50/60Hz交流电源供给本装置时，将所有控制调节都调至正常状态后，把VTVM(电子管电压表)连接于测点与底盘接地之间所得的读数。
2.电压由10000μV黑白或彩色信号测定。
波形测定条件：
向调谐器输入10000μV的87.5%调制色带信号的状态时进行测量。

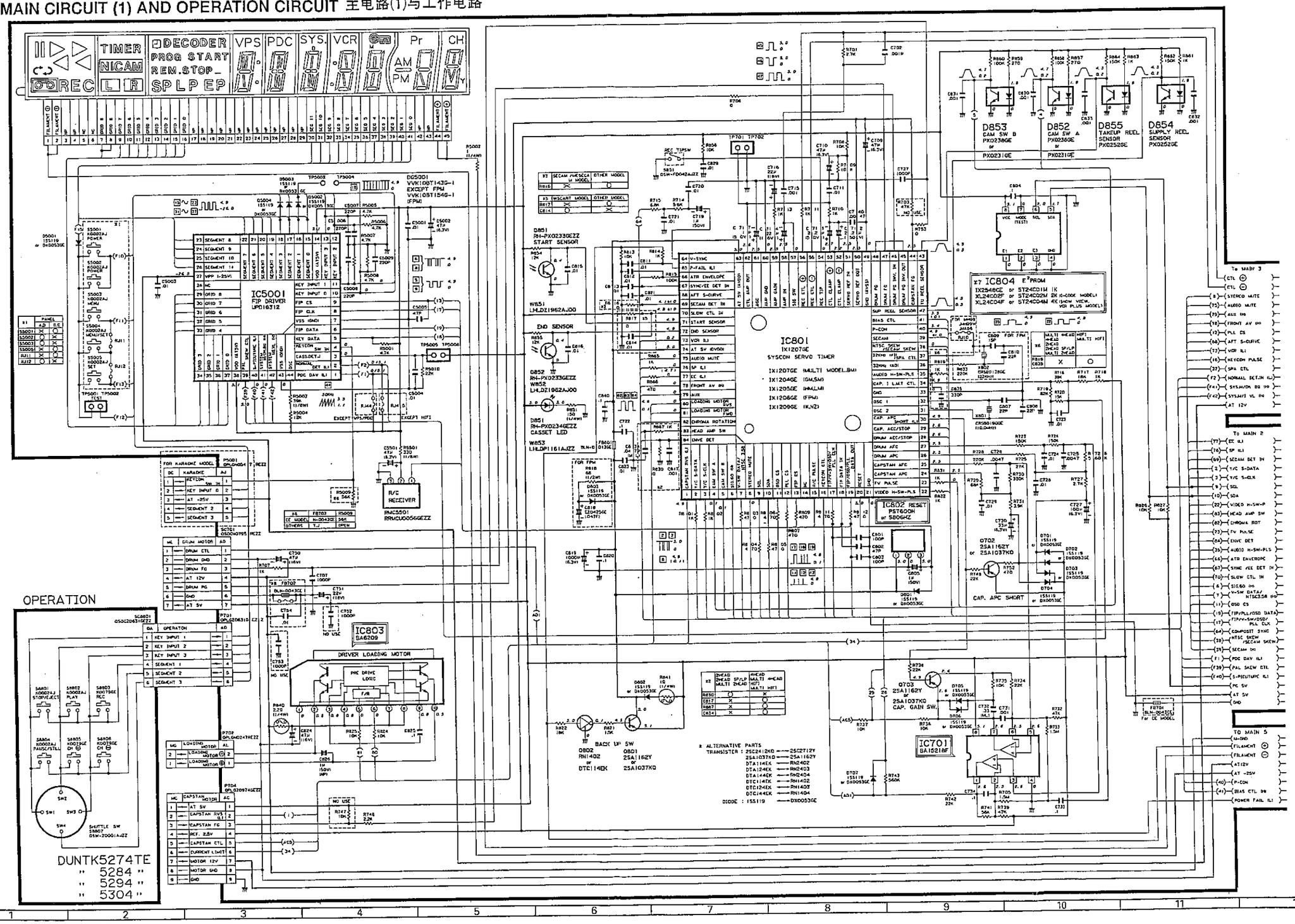
CAUTION:
This circuit diagram is original one. Therefore there may be a slight difference from yours.

注意：
这里的电路原理图均为最初设计原图，与您的机器的电路原理图可能有不同之处。

VC-MA33, VC-MA55, VC-MA223, VC-MA443	VC-MA33, VC-MA55, VC-MA223, VC-MA443

9. CIRCUIT DIAGRAM AND PWB FOIL PATTERN 电路方框图与印刷电路板图案

MAIN CIRCUIT (1) AND OPERATION CIRCUIT 主电路(1)与工作电路

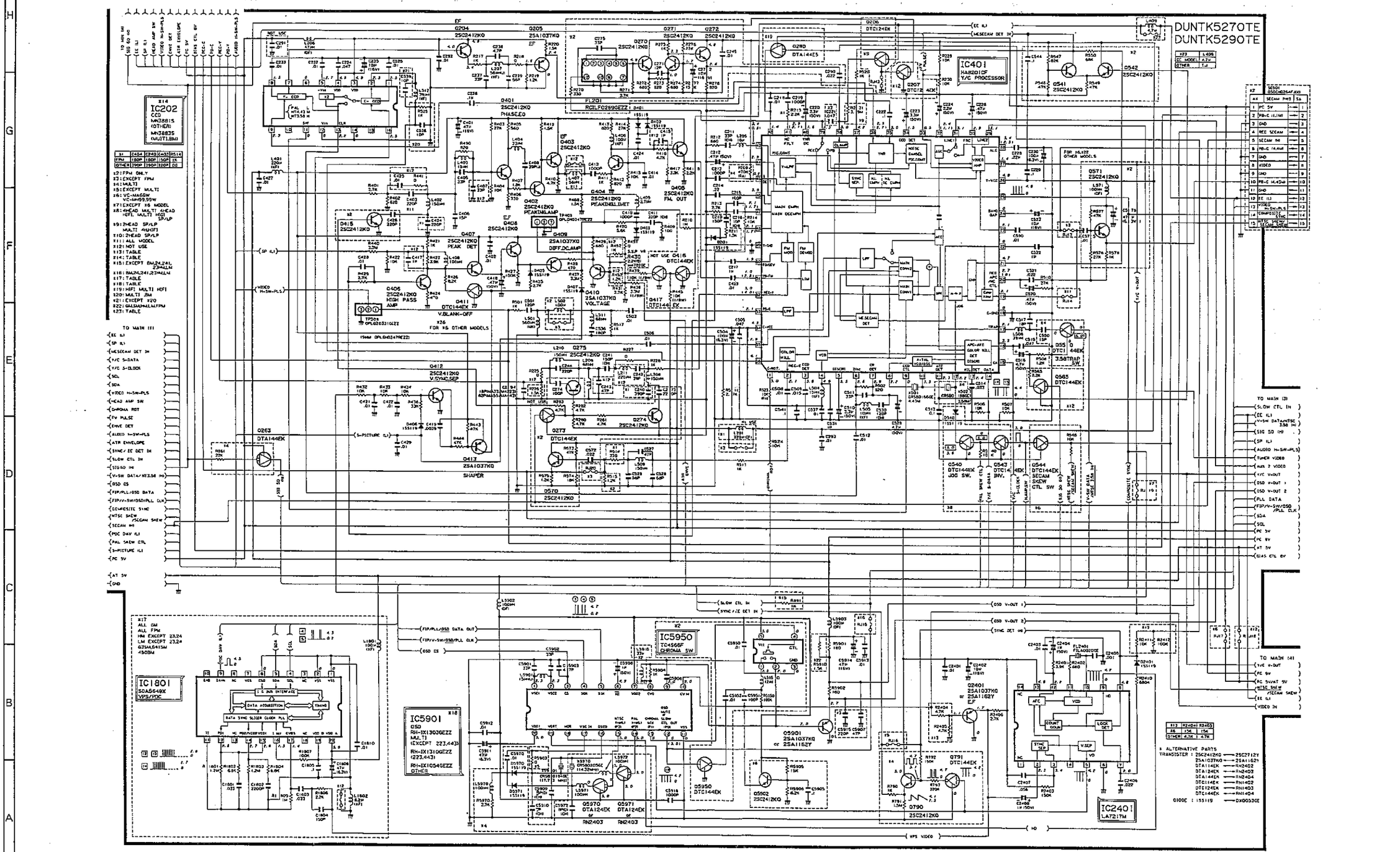


VOLTAGE MEASUREMENT MODE
PB . . . . . Parentheses ( )
REC . . . . . Without Parentheses

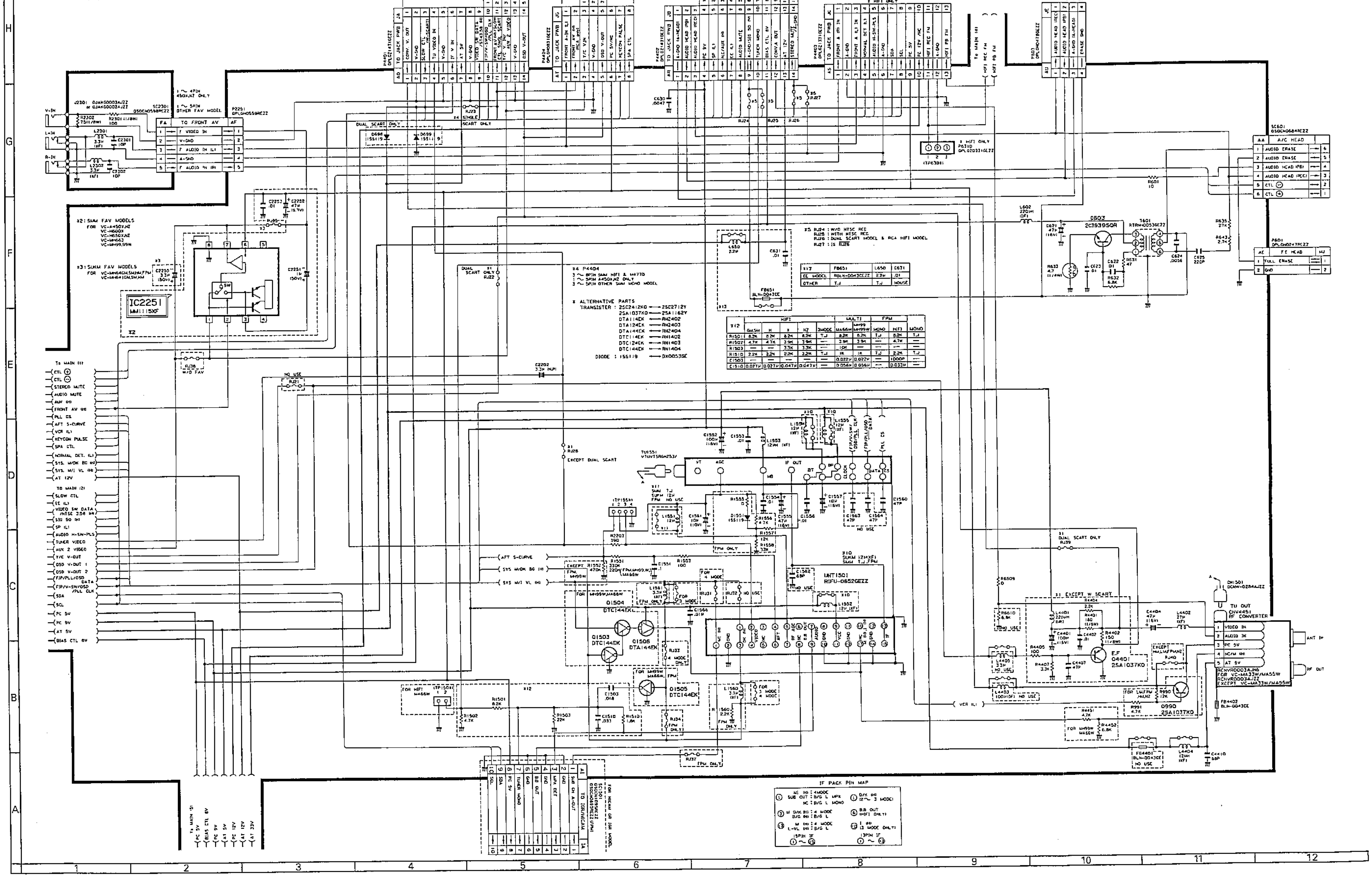
＊电压测定值
再现：括弧内的数值
记录：无括弧的数值

VC-MA33, VC-MA55, VC-MA223, VC-MA443	VC-MA33, VC-MA55, VC-MA223, VC-MA443

MAIN CIRCUIT (2)
主电路(2)



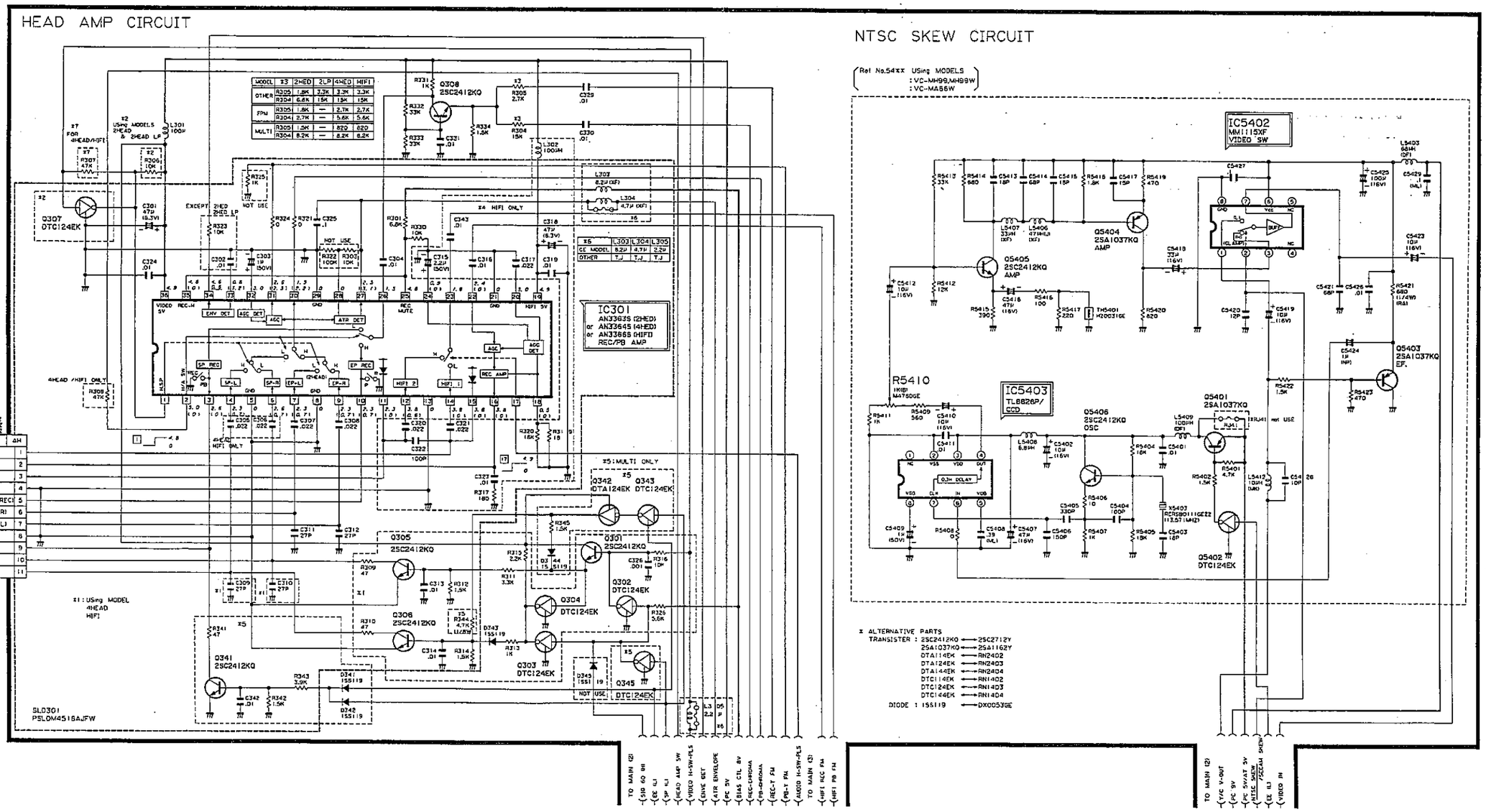
MAIN CIRCUIT (3)
主电路(3)


TO JACK PWB
TO FRONT AV
IC2251
MM1115XF
TU1551
VTUVTSRGHZ53Z
UNT1501
RIFU-0652GEZZ
Q1503
DTC144EK
Q1504
DTC144EK
Q1505
DTC144EK
Q1506
DTA144EK
Q503
2C3939SQR
T601
RTRN-0053GEZZ
Q4401
2SA1037KQ
Q990
2SA1037KQ
A/C HEAD
FE HEAD
CNV4451
RF CONVERTER
TU OUT
ANT IN
RF OUT
IF PACK PIN MAP
TO IGR/NICAM
* ALTERNATIVE PARTS
TRANSISTOR : 2SC2412KQ → 2SC2712Y
2SA1037KQ → 2SA1162Y
DTA114EK → RN2402
DTA124EK → RN2403
DTA144EK → RN2404
DTC114EK → RN1402
DTC124EK → RN1403
DTC144EK → RN1404
DIODE : 1SS119 → DX0053GE

VOLTAGE MEASUREMENT MODE
PB . . . . . . Parentheses ( )
REC . . . . . Without Parentheses

* 电压测定值
再现：括弧内的数值
记录：无括弧的数值

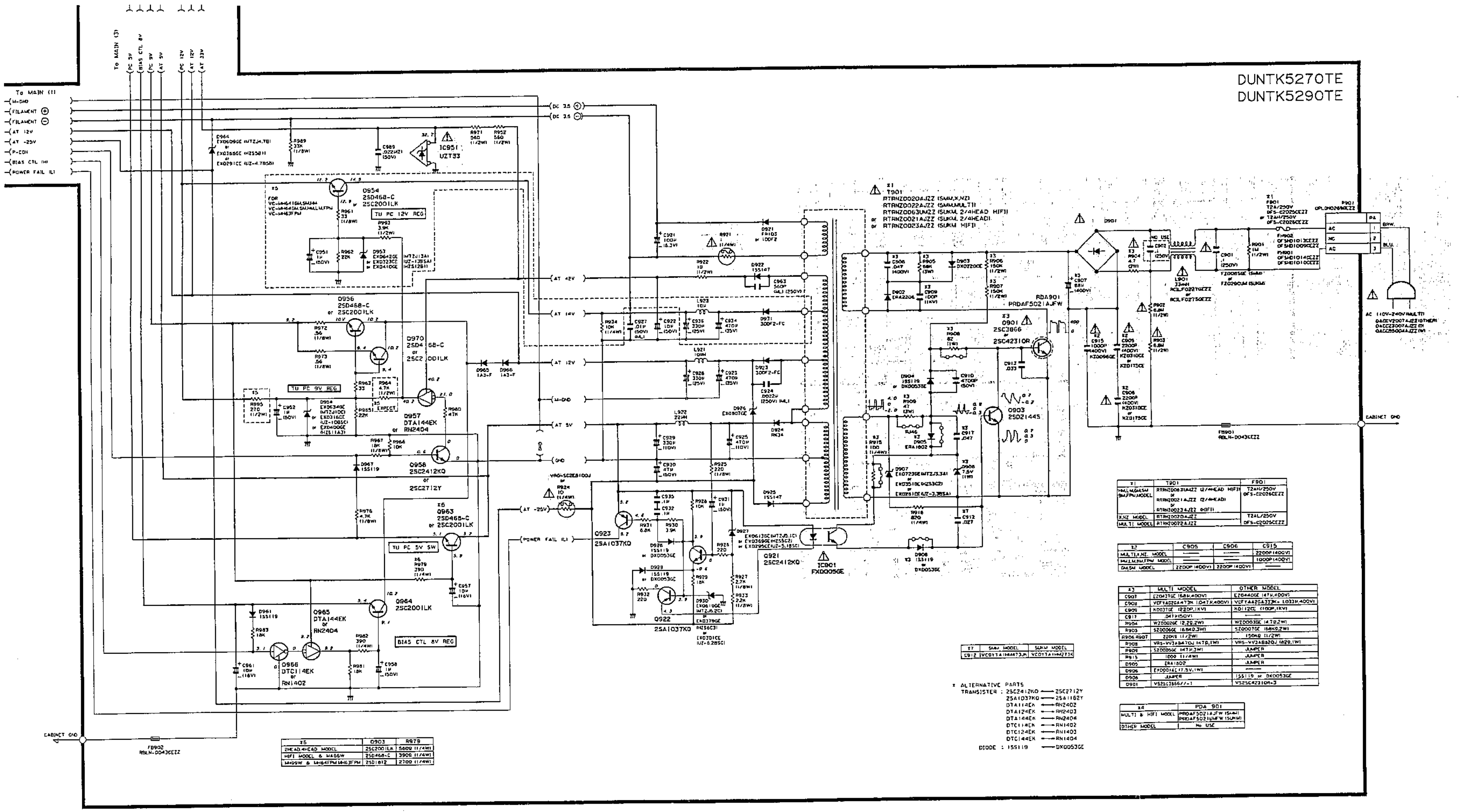
MAIN CIRCUIT (4)
主电路(4)



VOLTAGE MEASUREMENT MODE ＊电压测定值
PB ..... Parentheses ( ) 再现：括弧内的数值
REC ..... Without Parentheses 记录：无括弧的数值

VC-MA33, VC-MA55, VC-MA223, VC-MA443

POWER CIRCUIT
电源电路



x1	T901	F901
HM,LM,GM,SM BM,FPM MODEL	RTRNZ0063UMZZ (2/4HEAD HIFI) or RTRNZ0021AJZZ (2/4HEAD) or RTRNZ0023AJZZ (HIFI)	T2AH/250V QFS-C2026CEZZ
X,NZ MODEL	RTRNZ0020AJZZ	T2AL/250V QFS-C2025CEZZ
MULTI MODEL	RTRNZ0022AJZZ	

x2	C905	C906	C915
MULTI,X,NZ MODEL	——	——	2200P(400V)
HM,LM,BM,FPM MODEL	——	——	1000P(400V)
GM,SM MODEL	2200P(400V)	2200P(400V)	——

x3	MULTI MODEL	OTHER MODEL
C907	EZ0431GE (68μ,400V)	EZ0440GE (47μ,400V)
C908	VCFYA02GA473K (.047μ,400V)	VCFYAA2GA333K+ (.033μ,400V)
C909	KD0371GE (220P,1KV)	KD1120E (100P,1KV)
C917	.047μ(50V)	←——
R904	WZ0002GE (2.2Ω,2W)	WZ0003GE (4.7Ω,2W)
R905	SZ0006GE (68KΩ,3W)	SZ0007GE (68KΩ,2W)
R906 R907	220KΩ (1/2W)	150KΩ (1/2W)
R908	VRS-VV3AB470J (47Ω,1W)	VRS-VV3AB820J (82Ω,1W)
R909	SZ0005GE (47Ω,3W)	JUMPER
R915	100Ω (1/4W)	JUMPER
D905	ERA1802	JUMPER
D906	EX0001AE (7.5V,1W)	——
D908	JUMPER	1SS119 or DX0053GE
Q901	VS2SC3866//-1	VS2SC4231OR-3

x7	SMM MODEL	SUKM MODEL
C912	VCOYTA1HM473JK	VCOYTA1HM273K

x4	PDA 901
MULTI & HIFI MODEL	PRDAF5021AJFW (SMM) PRDAF5021UMFW (SUKM)
OTHER MODEL	No USE

x5	Q903	R979
2HEAD,4HEAD MODEL	2SC2001LK	560Ω (1/4W)
HIFI MODEL & MA66W	2SD468-C	390Ω (1/4W)
M499W & M464FPM M463FPM	2SD1812	270Ω (1/4W)

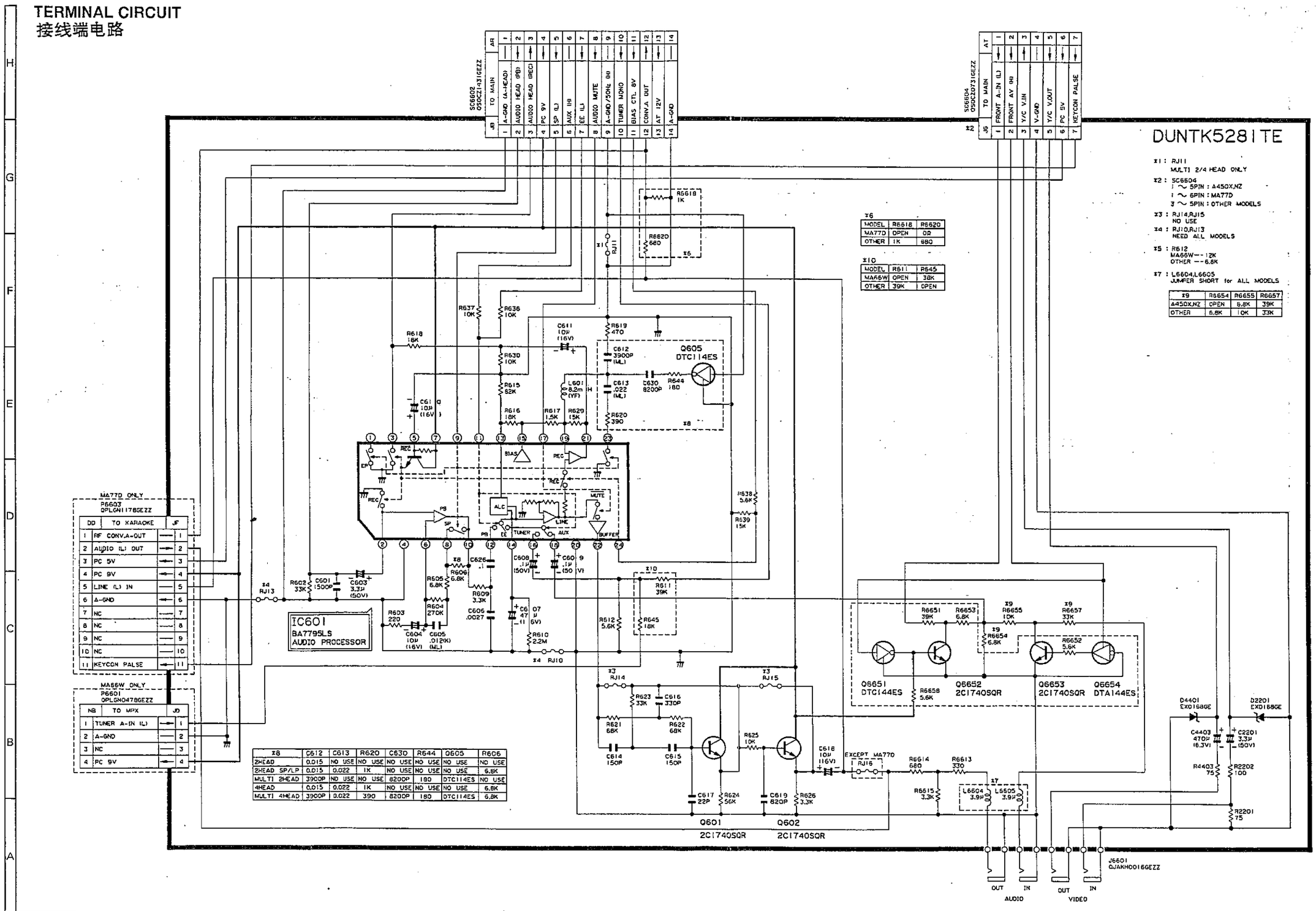
x ALTERNATIVE PARTS
TRANSISTER : 2SC2412KQ —— 2SC2712Y
2SA1037KQ —— 2SA1162Y
DTA114EK —— RN2402
DTA124EK —— RN2403
DTA144EK —— RN2404
DTC114EK —— RN1402
DTC124EK —— RN1403
DTC144EK —— RN1404
DIODE : 1SS119 —— DX0053GE

VOLTAGE MEASUREMENT MODE * 电压测定值
PB ...... Parentheses ( ) 再现：括弧内的数值
REC ..... Without Parentheses 记录：无括弧的数值

VC-MA33, VC-MA55, VC-MA223, VC-MA443

VC-MA33, VC-MA55, VC-MA223, VC-MA443

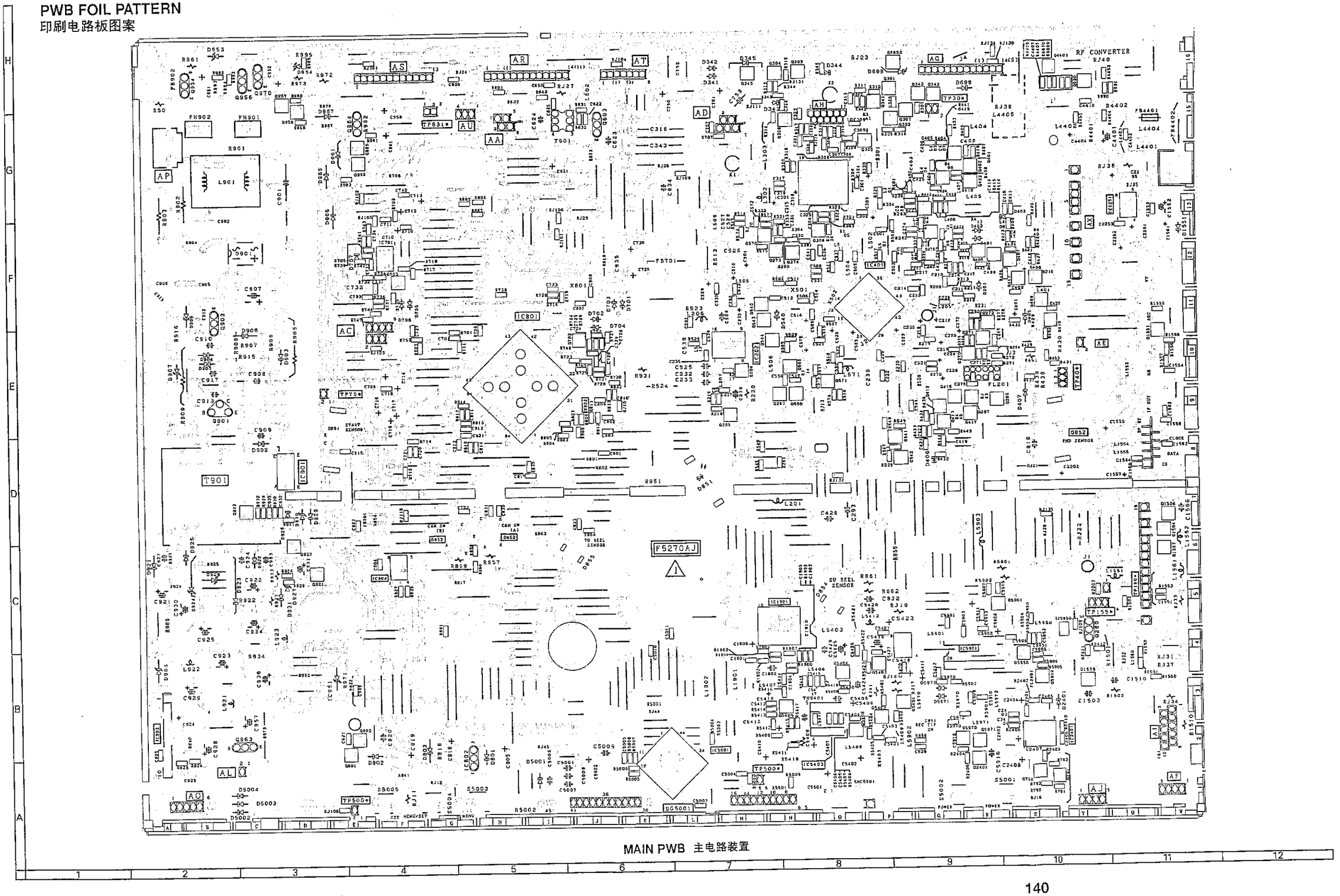
TERMINAL CIRCUIT
接线端电路



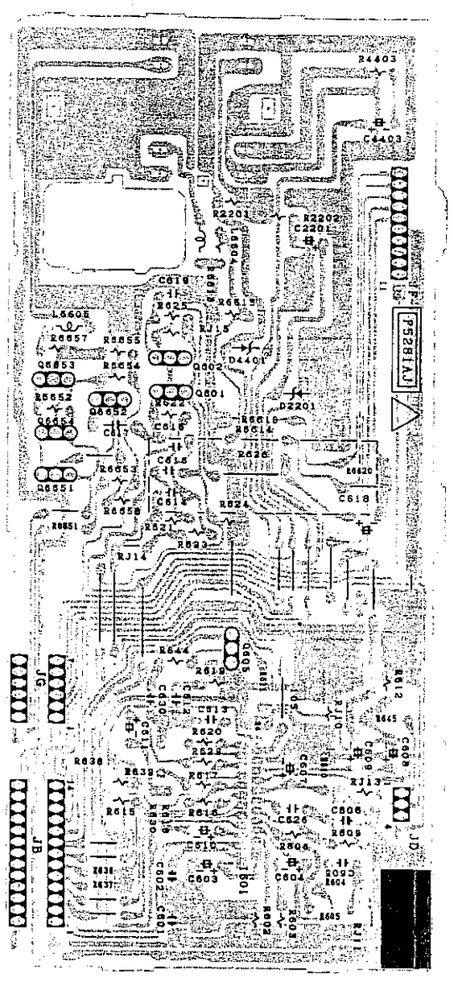
VOLTAGE MEASUREMENT MODE ＊电压测定值
PB ..... Parentheses ( ) 再现：括弧内的数值
REC ..... Without Parentheses 记录：无括弧的数值

VC-MA33, VC-MA55, VC-MA223, VC-MA443	VC-MA33, VC-MA55, VC-MA223, VC-MA443

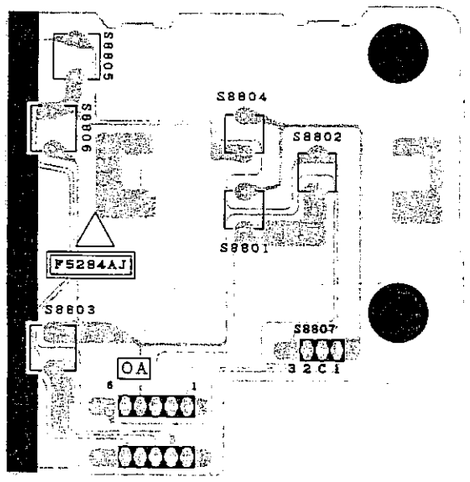
PWB FOIL PATTERN
印刷电路板图案



VC-MA33, VC-MA55,
VC-MA223, VC-MA443



TERMINAL UNIT
接线端电路装置



OPERATION UNIT
工作电路装置

10. REPLACEMENT PARTS LIST
PARTS REPLACEMENT

Many electrical and mechanical parts in video cassette recorder have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by ⚠ and shaded areas in the Replacement Parts Lists and Schematic Diagrams. The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION
5. PRICE CODE

MARK ★ : SPARE PARTS-DELIVERY SECTION.

HOW TO IDENTIFY CHIP TRANSISTORS AND DIODES BY ITS MARKING

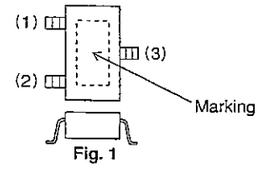


Fig. 1

(1) Base/Input
(2) Emitter/Ground
(3) Collector/Output

Package	Marking	Parts No.
Fig. 1	BQ	VS2SC2412KQ-1
Fig. 1	FQ	VS2SA1037KQ-1
Fig. 1	25	VSDTC124EK/-1
Fig. 1	26	VSDTC144EK/-1
Fig. 1	24	VSDTC114EK/-1
Fig. 1	16	VSDTA144EK/-1

10. 更换零件表
更换零件

盒式磁带录象机中，许多电路元件和机械零件具有特别安全要求的性质。这些性质并非能由元件的外观所决定。而且即使更换元件时，用更高电压容量，更大功率消耗的元件取而代之，也并非能满足其应该具有的特别安全要求。因此，本维修说明书对具有特别安全要求的零件均用标记加以识别：在此更换零件表以及电路原理图中，具有特别安全要求的电路元件均用⚠标记以便注意识别。更换零件时，为了用户的安全以及录象机原有的工作性能，务请使用夏普规定零件。否则，可能有导致触电、火灾或其他不测事故发生的可能。

更换零件的订货方法

为了能迅速而确实地接受订货、以及正确无误地按时交货，在订货时请将下列各项明确告知。

1. 型号
2. 参考编号
3. 零件编号
4. 零件名称
5. 代号

附★记号为备用部件的交货部门

Ref. No.	Part No.	★	Description	Code

PRINTED WIRING BOARD ASSEMBLIES
(NOT REPLACEMENT ITEM)

DUNTK5270TEV4	-	Main Unit (VC-MA33A/B/D/K/L/S)	—
DUNTK5270TEVE	-	Main Unit (VC-MA33W)	—
DUNTK5270TEV5	-	Main Unit (VC-MA55A/B/D/K/L/S)	—
DUNTK5270TEVF	-	Main Unit (VC-MA55W)	—
DUNTK5281TEV3	-	Terminal Unit (VC-MA223R, VC-MA33A/B/D/K/L/S/W)	—
DUNTK5281TEV4	-	Terminal Unit (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	—
DUNTK5304TEV0	-	Operation Unit	—

DUNTK5270WEV4/5/E/F
MAIN UNIT

ASSEMBLY UNIT

NOTE: THE PARTS HERE SHOWN ARE SUPPLIED AS AN ASSEMBLY BUT NOT INDEPENDENTLY

Ref. No.	Part No.	★	Description	Code
TU1551	VTUVTSR6HZ53/	J	VHF Tuner	
UNT150	RiFU-0652GEZZ	J	IF-Pack Unit	

INTEGRATED CIRCUITS

Ref. No.	Part No.	★	Description	Code
IC202	VHiMN3883S/1E	J	MN3883S-E1	AS
IC301	VHiAN3363S/-1	J	AN3363SB (VC-MA223R, VC-MA33A/B/D/K/L/S/W)	AH
IC301	VHiAN3364S/-1	J	AN3364SB (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AL
IC401	VHiHA8201CF-1	J	HA118201CF	AW
IC701	VHiBA15218F1E	J	BA15218F	AF
⚠IC801	RH-iX1207GEZZ	J	I.C.	
⚠IC802	VHiPST600H/-1	J	IC-PST600H-2	AE
IC803	VHiBA6209//1E	J	BA6209-V3	AG
IC804	RH-iX2548CEZZ	J	XI24C01Af	BA
IC901	RH-FX0005GEZZ	J	PS2561L-1-V	AE
IC951	VHiUZT33///-1	J	I.C.	AC
IC2401	VHiLA7217M/-1	J	LA7217M	AG
IC5001	VHiUPD16312-1	J	UPD16312GB-3B4	AQ
IC5901	RH-iX1303GEZZ	J	M35012-123SP (VC-MA33A/B/D/K/L/S/W, VC-MA55A/B/D/K/L/S/W)	
IC5901	RH-iX1310GEZZ	J	M35013-070SP (VC-MA223R, VC-MA443R)	

TRANSISTORS

Ref. No.	Part No.	★	Description	Code
Q204	VS2SC2412KQ-1	J	2SC2412K	AA
Q205	VS2SA1037KQ-1	J	2SA1037K	AA
Q206	VSDTC124EK/-1	J	DTC124E (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AB
Q263	VSDTA144EK/-1	J	DTA144E	AC
Q301	VS2SC2412KQ-1	J	2SC2412K (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
Q302	VSDTC124EK/-1	J	DTC124E (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AB
Q303	VSDTC124EK/-1	J	DTC124E (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AB
Q304	VSDTC124EK/-1	J	DTC124E (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AB
Q305	VS2SC2412KQ-1	J	2SC2412K (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
Q306	VS2SC2412KQ-1	J	2SC2412K (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
Q307	VSDTC124EK/-1	J	DTC124E (VC-MA223R, VC-MA33A/B/D/K/L/S/W)	AB
Q308	VS2SC2412KQ-1	J	2SC2412K	AA
Q341	VS2SC2412KQ-1	J	2SC2412K (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
Q342	VSDTA124EK/-1	J	DTA124E (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AB
Q343	VSDTC124EK/-1	J	DTC124E (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AB
Q345	VSDTC124EK/-1	J	DTC124E (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AB
Q401	VS2SC2412KQ-1	J	2SC2412K	AA
Q402	VS2SC2412KQ-1	J	2SC2412K	AA
Q403	VS2SC2412KQ-1	J	2SC2412K	AA
Q404	VS2SC2412KQ-1	J	2SC2412K	AA
Q405	VS2SC2412KQ-1	J	2SC2412K	AA
Q406	VS2SC2412KQ-1	J	2SC2412K	AA
Q407	VS2SC2412KQ-1	J	2SC2412K	AA
Q408	VS2SC2412KQ-1	J	2SC2412K	AA
Q409	VS2SA1037KQ-1	J	2SC1037K	AA
Q410	VS2SA1037KQ-1	J	2SC1037K	AA
Q411	VSDTC144EK/-1	J	DTC144EDTC144E	AB
Q412	VS2SC2412KQ-1	J	2SC2412K	AA
Q413	VS2SA1037KQ-1	J	2SC1037K	AA
Q416	VSDTC144EK/-1	J	DTC144E (VC-MA223R, VC-MA443R)	AB
Q417	VSDTC144EK/-1	J	DTC144E (VC-MA223R, VC-MA443R)	AB
Q540	VSDTC144EK/-1	J	DTC144E (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AB
Q543	VSDTC144EK/-1	J	DTC144E (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AB
Q550	VSDTC144EK/-1	J	DTC144EDTC144E	AB
Q603	VS2C3939SQR-1	J	2SC3939S	AC
Q702	VS2SA1037KQ-1	J	2SC1037K	AA
Q703	VS2SA1037KQ-1	J	2SC1037K	AA
Q790	VS2SC2412KQ-1	J	2SC2412K	AA
Q791	VSDTC144EK/-1	J	DTC144E	AB
Q801	VS2SA1037KQ-1	J	2SC1037K	AA
Q802	VSDTC114EK/-1	J	DTC144E	AB
Q851	RH-PX0233GEZZ	J	Pt493FI2	AD
Q852	RH-PX0233GEZZ	J	Pt493FI2	AD
⚠Q901	VS2SC4231QR-3	J	2SC4231	AH
⚠Q903	VS2SD2144S/-1	J	2SD2144S	AC
Q921	VS2SC2412KQ-1	J	2SC2412K	AA
Q922	VS2SA1037KQ-1	J	2SC1037K	AA

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Ref. No.	Part No.	★	Description	Code
Q923	VS2SA1037KQ-1	J	2SC1037K	AA
Q956	VS2SD468-C/-1	J	2SD468	AD
Q957	VSDTA144EK/-1	J	DTC144E	AC
Q958	VS2SC2412KQ-1	J	2SC2412K	AA
Q963	VS2SC2001LK-1	J	2SC2001	AA
Q964	VS2SC2001LK-1	J	2SC2001	AA
Q965	VSDTA144EK/-1	J	DTC144E	AC
Q966	VSDTC114EK/-1	J	DTC114E	AB
Q970	VS2SD468-C/-1	J	2SD468	AD
Q2401	VS2SA1037KQ-1	J	2SC1037K	AA
Q4401	VS2SA1037KQ-1	J	2SC1037K	AA
Q5901	VS2SA1037KQ-1	J	2SC1037K	AA
Q5970	VSDTC124EK/-1	J	DTC124E	AB
Q5971	VSDTA124EK/-1	J	DTC124E	AB
			DIODES	
D341	VHD1SS119//-1	J	1SS119 (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AB
D342	VHD1SS119//-1	J	1SS119 (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AB
D343	VHD1SS119//-1	J	1SS119 (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AB
D344	VHD1SS119//-1	J	1SS119 (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AB
D401	VHD1SS119//-1	J	1SS119	AB
D402	VHD1SS119//-1	J	1SS119	AB
D403	VHD1SS119//-1	J	1SS119	AB
D405	VHD1SS119//-1	J	1SS119	AB
D406	VHD1SS119//-1	J	1SS119	AB
D407	VHD1SS119//-1	J	1SS119	AB
D540	VHD1SS119//-1	J	1SS119 (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AB
D701	VHD1SS119//-1	J	1SS119	AB
D702	VHD1SS119//-1	J	1SS119	AB
D703	VHD1SS119//-1	J	1SS119	AB
D704	VHD1SS119//-1	J	1SS119	AB
D705	VHD1SS119//-1	J	1SS119	AB
D706	VHD1SS119//-1	J	1SS119	AB
D707	VHD1SS119//-1	J	1SS119	AB
D801	VHD1SS119//-1	J	1SS119	AB
D802	VHD1SS119//-1	J	1SS119	AB
D851	RH-PX0234GEZZ	J	Photodiode	AD
D852	RH-PX0238GEZZ	J	RPi-352S	AF
D853	RH-PX0238GEZZ	J	RPi-352S	AF
D854	RH-PX0252GEZZ	J	GP1S563	AF
D855	RH-PX0252GEZZ	J	GP1S563	AF
⚠D901	RH-DX0083GEZZ	J	Diode	AC
⚠D902	VHDERA2206/-1	J	Diode	AC
⚠D903	RH-DX0220CEZZ	J	Diode	AB
⚠D904	VHD1SS119//-1	J	Diode	AB
⚠D905	VHDERA1802/-1	J	Diode	AB
⚠D906	RH-EX0001AEZZ	J	Zener Diode	AC
⚠D907	RH-EX0723GEZZ	J	Zener Diode	AB
D921	VHDFR103///-1	J	Diode	AC
D922	VHD1SS147//-1	J	1SS147	AA
D923	VHD30DF2-FC-1	J	Diode	AE
D924	VHDRK34////-1	J	Diode	AE
D925	VHD1SS147//-1	J	1SS147	AA
D926	RH-EX0807GEZZ	J	Zener Diode	AC
D927	RH-EX0613GEZZ	J	Zener Diode	AA
D928	VHD1SS119//-1	J	1SS119	AB
D929	VHD1SS119//-1	J	1SS119	AB
D930	RH-EX0619GEZZ	J	Zener Diode	AA
D954	RH-EX0634GEZZ	J	Zener Diode	AA
D961	VHD1SS119//-1	J	1SS119	AB
D964	RH-EX0609GEZZ	J	Zener Diode	AA
D965	VHD1A3-F///-1	J	Diode	AA
D966	VHD1A3-F///-1	J	Diode	AA
D967	VHD1SS119//-1	J	1SS119	AB
D2401	VHD1SS119//-1	J	1SS119	AB
D5001	VHD1SS119//-1	J	1SS119	AB
D5002	VHD1SS119//-1	J	1SS119	AB
D5003	VHD1SS119//-1	J	1SS119	AB
D5004	VHD1SS119//-1	J	1SS119	AB
D5970	VHD1SS119//-1	J	1SS119	AB
D5971	VHD1SS119//-1	J	1SS119	AB
			PACKAGED CIRCUITS	
X501	RCRSB0166GEZZ	J	Crystal 4.43MHz	AG
X502	RCRSB0188GEZZ	J	Crystal 3.58MHz	AG
X801	RCRSB0190GEZZ	J	Crystal 10.0MHz	AM
X5901	RCRSB0184GEZZ	J	Crystal 17.73MHz	AM
X5970	RCRSB0205GEZZ	J	Crystal 14.32MHz	AM
			COILS AND TRANSFORMERS	
FL2401	RFILA0020CEZZ	J	Filter	AD
L205	VP-XF100K0000	J	Peaking 10µH	AB
L206	VP-DF470K0000	J	Peaking 47µH	AB
L207	VP-XF560J0000	J	Peaking 56µH	AB
L208	VP-XF151K0000	J	Peaking 150µH	AB
L209	VP-XF680K0000	J	Peaking 68µH	AB
L210	VP-XF151K0000	J	Peaking 150µH	AB
L301	VP-MK101K0000	J	Peaking 100µH	AB
L401	VP-XF221J0000	J	Peaking 220µH	AB
L402	VP-XF151K0000	J	Peaking 150µH	AB
L403	VP-XF150J0000	J	Peaking 15µH	AB
L404	VP-XF330J0000	J	Peaking 33µH	AB
L405	VP-XF2R7J0000	J	Peaking 2.7µH	AC
L406	VP-XF101K0000	J	Peaking 100µH (VC-MA33A/B/D/K/L/S/W, VC-MA55A/B/D/K/L/S/W)	AB
L407	VP-XF330K0000	J	Peaking 33µH (VC-MA33A/B/D/K/L/S/W, VC-MA55A/B/D/K/L/S/W)	AB

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Ref. No.	Part No.	★	Description	Code
L408	VP-XF101K0000	J	Peaking 100µH	AB
L501	VP-MK561K0000	J	Peaking 560µH	AB
L504	VP-XF150J0000	J	Peaking 15µH	AB
L505	VP-XF100K0000	J	Peaking 10µH	AB
L506	VP-XF390K0000	J	Peaking 39µH	AB
L509	VP-XF151K0000	J	Peaking 150µH	AB
L511	VP-XF680K0000	J	Peaking 68µH	AB
L512	VP-XF390K0000	J	Peaking 39µH	AB
L602	VP-DF221K0000	J	Peaking 220µH	AB
⚠L901	RCILF0227GEZZ	J	Coil 33mH	AM
L921	RCILP0171CEZZ	J	Coil 10µH	AD
L922	RCILP0175CEZZ	J	Coil 22µH	AD
L1553	VP-XF120K0000	J	Peaking 12µH	AB
L4401	VP-MK221K0000	J	Peaking 220µH	AB
L4402	VP-XF270K0000	J	Peaking 27µH	AB
L4404	VP-XF120K0000	J	Peaking 12µH	AB
L5901	VP-XF150J0000	J	Peaking 15µH	AB
L5902	VP-DF101K0000	J	Peaking 100µH	AB
L5903	VP-DF101K0000	J	Peaking 100µH	AB
L5970	VP-XF101K0000	J	Peaking 100µH	AB
L5971	VP-XF101K0000	J	Peaking 100µH	AB
L5972	VP-XF101K0000	J	Peaking 100µH	AB
T601	RTRNH0053GEZZ	J	Osc. Transformer	AE
⚠T901	RTRNZ0022AJZZ	J	Transformer	AS

CONTROL

R430	RVR-M4782GEZZ		Variable Resistor	AB

CAPACITORS

C211	VCCCCY1HH330J	J	33p	50V	Ceramic	AA
C212	VCEAEM1HW474M	J	0.47	50V	Electrolytic	AB
C213	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
C214	VCKYCY1CF224Z	J	0.22	16V	Ceramic	AA
C215	VCCCCY1HH101J	J	100p	50V	Ceramic	AA
C216	VCCCCY1HH100D	J	10p	50V	Ceramic	AA
C217	VCKYCY1AF105Z	J	1	10V	Ceramic	AC
C218	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C219	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
C220	VCEAEM1HW335M	J	3.3	50V	Electrolytic	AB
C221	VCKYCY1HF473Z	J	0.047	50V	Ceramic	AA
C222	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C223	VCEAEM1HW335M	J	3.3	50V	Electrolytic	AB
C224	VCEAEM1HW225M	J	2.2	50V	Electrolytic	AB
C226	VCEAEM1HW474M	J	0.47	50V	Electrolytic	AB
C228	VCKYCY1CF224Z	J	0.22	16V	Ceramic	AA
C229	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C230	VCEAEM0JW107M	J	100	6.3V	Electrolytic	AB
C232	VCKYD41CY103N	J	0.01	16V	Ceramic	AA
C233	VCKYD41CY103N	J	0.01	16V	Ceramic	AA
C234	VCKYCY1HF473Z	J	0.047	50V	Ceramic	AA
C235	VCEAEM1CW106M	J	10	16V	Electrolytic	AB
C236	VCKYD41HF104Z	J	0.1	50V	Ceramic	AA
C237	VCCCCY1HH330J	J	33p	50V	Ceramic	AA
C238	VCCCD41HH4R7K	J	4.7p	50V	Ceramic	AA
C239	VCCCCY1HH560J	J	56p	50V	Ceramic	AA
C240	VCKYCY1HB391K	J	390p	50V	Ceramic	AA
C241	VCCCCY1HH151J	J	150p	50V	Ceramic	AA
			(VC-MA223R, VC-MA33A/B/D/K/L/S/W)			
C241	VCKYCY1HB330K	J	33p	50V	Ceramic	AA
			(VC-MA443R, VC-MA55A/B/D/K/L/S/W)			
C244	VCCCCY1HH221J	J	220p	50V	Ceramic	AA
C292	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C293	VCKYD41CY103N	J	0.01	16V	Ceramic	AA
C294	VCCCCY1HH180J	J	18p	50V	Ceramic	AA
			(VC-MA223R, VC-MA33A/B/D/K/L/S/W)			
C294	VCCCCY1HH820J	J	82p	50V	Ceramic	AA
			(VC-MA443R, VC-MA55A/B/D/K/L/S/W)			
C301	VCEAEM0JW476M	J	47	6.3V	Electrolytic	AB
C302	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
			(VC-MA443R, VC-MA55A/B/D/K/L/S/W)			
C303	VCEAEM1HW105M	J	1	50V	Electrolytic	AB
C304	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C305	VCKYCY1HF223Z	J	0.022	50V	Ceramic	AB
			(VC-MA443R, VC-MA55A/B/D/K/L/S/W)			
C306	VCKYCY1HF223Z	J	0.022	50V	Ceramic	AB
			(VC-MA443R, VC-MA55A/B/D/K/L/S/W)			
C307	VCKYCY1HF223Z	J	0.022	50V	Ceramic	AB
C308	VCKYCY1HF223Z	J	0.022	50V	Ceramic	AB
C309	VCCCCY1HH270J	J	27p	50V	Ceramic	AA
			(VC-MA443R , VC-MA55A/B/D/K/L/S/W)			
C310	VCCCCY1HH270J	J	27p	50V	Ceramic	AA
			(VC-MA443R, VC-MA55A/B/D/K/L/S/W)			
C311	VCCCCY1HH270J	J	27p	50V	Ceramic	AA
C312	VCCCCY1HH270J	J	27p	50V	Ceramic	AA
C313	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
			(VC-MA443R, VC-MA55A/B/D/K/L/S/W)			
C314	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
			(VC-MA443R, VC-MA55A/B/D/K/L/S/W)			
C324	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C325	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C326	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
			(VC-MA443R, VC-MA55A/B/D/K/L/S/W)			
C329	VCKYD41CY103N	J	0.01	16V	Ceramic	AA
C330	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C331	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA

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Ref. No.	Part No.	★	Description			Code
C342	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
			(VC-MA443R, VC-MA55A/B/D/K/L/S/W)			
C401	VCEAEM1CW476M	J	47	16V	Electrolytic	AB
C402	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C403	VCCSD41HL560J	J	56p	50V	Ceramic	AA
			(VC-MA223R, VC-MA443R)			
C403	VCKYD41HB221K	J	220p	50V	Ceramic	AA
			(VC-MA33A/B/D/K/L/S/W, VC-MA55A/B/D/K/L/S/W)			
C404	VCKYCY1HB391K	J	390p	50V	Ceramic	AA
C405	VCCCCY1HH330J	J	33p	50V	Ceramic	AA
C406	VCCCD41HH150J	J	15p	50V	Ceramic	AA
C408	VCCSD41HL390J	J	39p	50V	Ceramic	AA
C410	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
C411	VCKYCY1HB331K	J	330p	50V	Ceramic	AA
C412	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
C414	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C418	VCEAEM1HW474M	J	0.47	50V	Electrolytic	AB
C419	VCKYCY1HB392K	J	3900p	50V	Ceramic	AA
C421	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C422	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C423	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C424	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C425	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C427	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C428	VCKYD41CY103N	J	0.01	16V	Ceramic	AA
C429	VCKYD41CY103N	J	0.01	16V	Ceramic	AA
C501	VCKYCY1HB332K	J	3300p	50V	Ceramic	AA
C503	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C504	VCEAEM0JW107M	J	100	6.3V	Electrolytic	AB
C505	VCKYCY1HF473Z	J	0.047	50V	Ceramic	AA
C506	VCKYD41CY103N	J	0.01	16V	Ceramic	AA
C508	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C509	VCKYCY1EB153K	J	0.015	25V	Ceramic	AA
C510	VCEAEM1HW335M	J	3.3	50V	Electrolytic	AB
C511	VCCCCY1HH330J	J	33p	50V	Ceramic	AA
C512	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C513	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C514	VCKYCY1HF333Z	J	0.033	50V	Ceramic	AA
C515	VCKYCY1HF473Z	J	0.047	50V	Ceramic	AA
C516	VCEAEM1HW475M	J	4.7	50V	Electrolytic	AB
C517	VCCCCY1HH180J	J	18p	50V	Ceramic	AA
C520	VCEAEM1HW474M	J	0.47	50V	Electrolytic	AB
C521	VCKYCY1HF223Z	J	0.022	50V	Ceramic	AB
C522	VCKYCY1AF105Z	J	1	10V	Ceramic	AC
C523	VCEAEM1CW106M	J	10	16V	Electrolytic	AB
C525	VCKYD41CY103N	J	0.01	16V	Ceramic	AA
C526	VCCSD41HL680J	J	68p	50V	Ceramic	AA
C527	VCCSD41HL470J	J	47p	50V	Ceramic	AA
C528	VCCSD41HL560J	J	56p	50V	Ceramic	AA
C529	VCEAEM1HW475M	J	4.7	50V	Electrolytic	AB
C530	VCCCCY1HH121J	J	120p	50V	Ceramic	AA
C531	VCCCCY1HH1R0C	J	1p	50V	Ceramic	AA
C536	VCCCCY1HH181J	J	180p	50V	Ceramic	AA
C537	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C538	VCCSD41HL100J	J	10p	50V	Ceramic	AA
C541	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C544	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C550	VCCCCY1HH150J	J	15p	50V	Ceramic	AA
C590	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C621	VCEAEM1CW476M	J	47	16V	Electrolytic	AB
C622	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C623	VCKYD41CY103N	J	0.01	16V	Ceramic	AA
C624	VCQPYA2AA562J	J	5600p	100V		AC
C625	VCCCCY1HH221J	J	220p	50V	Ceramic	AA
C630	RC-QZA472TAYJ	J	Capacitor			AB
C702	VCKYD41HB102K	J	1000p	50V	Ceramic	AA
C707	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
C709	VCEAEM0JW476M	J	47	6.3V	Electrolytic	AB
C710	VCEAEM0JW476M	J	47	6.3V	Electrolytic	AB
C711	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C712	VCEAEM1HW225M	J	2.2	50V	Electrolytic	AB
C713	VCEAEM1HW225M	J	2.2	50V	Electrolytic	AB
C714	VCEAEM1CW226M	J	22	16V	Electrolytic	AB
C715	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
C716	VCEAEM1CW226M	J	22	16V	Electrolytic	AB
C717	VCEAEM1HW105M	J	1	50V	Electrolytic	AB
C719	VCEAEM1HW105M	J	1	50V	Electrolytic	AB
C720	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C721	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C722	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C723	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C724	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C725	VCKYCY1HB472K	J	4700p	50V	Ceramic	AA
C726	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C727	VCEAEM0JW107M	J	100	6.3V	Electrolytic	AB
C728	VCKYCY1HB472K	J	4700p	50V	Ceramic	AA
C729	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C730	VCEAEM0JW336M	J	33	6.3V	Electrolytic	AA
C731	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
C732	VCFYSA1HB334J	J	0.33	50V		AB
C733	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C734	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C737	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
C740	VCKYCY1HB472K	J	4700p	50V	Ceramic	AA
C750	VCEAEM1CW476M	J	47	16V	Electrolytic	AB
C751	VCEAEM1CW226M	J	22	16V	Electrolytic	AB
C801	VCCCCY1HH101J	J	100p	50V	Ceramic	AA
C802	VCCCCY1HH470J	J	47p	50V	Ceramic	AA
C803	VCCCCY1HH101J	J	100p	50V	Ceramic	AA
C804	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C805	VCEAEM1HW105M	J	1	50V	Electrolytic	AB
C807	VCCCCY1HH220J	J	22p	50V	Ceramic	AA
C808	VCCCCY1HH220J	J	22p	50V	Ceramic	AA
C811	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C812	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C813	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C815	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA

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Ref. No.	Part No.	★	Description			Code
C816	VCKYD41CY103N	J	0.01	16V	Ceramic	AA
C817	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
			(VC-MA443R, VC-MA55A/B/D/K/L/S/W)			
C819	VCEAGA0JW108M	J	1000	6.3V	Electrolytic	AC
C820	VCKYD41HF104Z	J	0.1	50V	Ceramic	AA
C821	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C823	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C824	VCEAEM1CW476M	J	47	16V	Electrolytic	AB
C825	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C826	VCE9EM1HW105M	J	1	50V	Elect. (N.P)	AB
C829	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C830	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
C831	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
C832	VCKYD41HB102K	J	1000p	50V	Ceramic	AA
C833	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
C834	VCQYTA1HM473J	J	0.047	50V	Mylar	AA
			(VC-MA443R, VC-MA55A/B/D/K/L/S/W)			
C840	VCKYD41HF104Z	J	0.1	50V	Ceramic	AA
⚠C901	RC-FZ008SGEZZ	J	Capacitor			AD
⚠C907	RC-EZ0437GEZZ	J	Capacitor			AK
⚠C908	VCFYAG2GA473K	J	0.047	400V		AD
⚠C909	RC-KZ0037GEZZ	J	Capacitor			AC
⚠C910	VCKYPA1HB472K	J	4700p	50V	Ceramic	AA
⚠C912	VCQYTA1HM473J	J	0.047	50V	Mylar	AA
⚠C913	VCQYTA1HM333J	J	0.033	50V	Mylar	AA
⚠C915	RC-KZ0128CEZZ	J	Capacitor			AD
⚠C917	VCQYTA1HM473J	J	0.047	50V	Mylar	AA
C921	VCEAGA0JW107M	J	100	6.3V	Electrolytic	AB
C922	VCEAGA1HW106M	J	10	50V	Electrolytic	AC
C923	VCEAVA1VN477M	J	470	35V	Electrolytic	AD
C924	RC-QZ0104GEZZ	J	Capacitor			AC
C925	VCEAVA1AN477M	J	470	10V	Electrolytic	AC
C927	VCQYTA1HM103J	J	0.01	50V	Mylar	AA
C928	VCEAGA1EW337M	J	330	25V	Electrolytic	AC
C929	VCEAGA1AW337M	J	330	10V	Electrolytic	AB
C930	VCEAGA1HW476M	J	47	50V	Electrolytic	AB
C931	VCEAEA1HW105M	J	1	50V	Electrolytic	AB
C932	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C935	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C952	VCEAEM1HW105M	J	1	50V	Electrolytic	AB
C957	VCEAEA1CW106M	J	10	16V	Electrolytic	AB
C958	VCEAEM1HW105M	J	1	50V	Electrolytic	AB
C961	VCEAEM1CW106M	J	10	16V	Electrolytic	AB
C989	VCKYCY1HF223Z	J	0.022	50V	Ceramic	AB
C1551	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C1552	VCEAGA1CW107M	J	100	16V	Electrolytic	AB
C1553	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C1554	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C1555	VCEAEM1CW476M	J	47	16V	Electrolytic	AB
			(Except VC-MA33W, VC-MA55W)			

Ref. No.	Part No.	★	Description			Code
C1556	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C1557	VCEAEM1CW106M	J	10	16V	Electrolytic	AB
C1560	VCCCCY1HH470J	J	47p	50V	Ceramic	AA
C1561	VCEAEM1CW106M	J	10	16V	Electrolytic	AB
C2401	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C2402	VCEAEM1CW106M	J	10	16V	Electrolytic	AB
C2403	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C2404	VCEAEM1HW105M	J	1	50V	Electrolytic	AB
C2405	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
C2406	VCKYCY1HF223Z	J	0.022	50V	Ceramic	AB
C2407	VCFYSA1HB563J	J	0.056	50V		AA
C2408	VCEAEM1HW105M	J	1	50V	Electrolytic	AB
C4401	VCEAEA1CW107M	J	100	16V	Electrolytic	AC
C4402	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C4404	VCEAEM1CW476M	J	47	16V	Electrolytic	AB
C5001	VCKYD41CY103N	J	0.01	16V	Ceramic	AA
C5002	VCEAEM0JW476M	J	47	6.3V	Electrolytic	AB
C5003	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C5004	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C5005	VCCCCY1HH470J	J	47p	50V	Ceramic	AA
C5006	VCKYD41HB221K	J	220p	50V	Ceramic	AA
C5007	VCKYD41HB221K	J	220p	50V	Ceramic	AA
C5008	VCKYD41HB221K	J	220p	50V	Ceramic	AA
C5009	VCKYD41HB221K	J	220p	50V	Ceramic	AA
C5501	VCEAEM0JW476M	J	47	6.3V	Electrolytic	AB
C5901	VCCCCY1HH330J	J	33p	50V	Ceramic	AA
C5902	VCCCCY1HH330J	J	33p	50V	Ceramic	AA
C5903	VCCCCY1HH470J	J	47p	50V	Ceramic	AA
C5906	VCEAEM1HW105M	J	1	50V	Electrolytic	AB
C5907	VCCCCY1HH470J	J	47p	50V	Ceramic	AA
C5908	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C5909	VCCCCY1HH8R0D	J	8p	50V	Ceramic	AA
C5910	VCCCCY1HH7R0D	J	7p	50V	Ceramic	AA
C5911	VCEAEM0JW476M	J	47	6.3V	Electrolytic	AB
C5912	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C5913	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C5914	VCEAEM1CW476M	J	47	16V	Electrolytic	AB
C5915	VCKYCY1HB221K	J	220p	50V	Ceramic	AA
C5916	VCKYD41HB102K	J	1000p	50V	Ceramic	AA
C5970	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C5972	VCCCCY1HH8R0D	J	8p	50V	Ceramic	AA

RESISTORS

RJ100	VRS-CY1JF000J	J	00	1/16W	Metal Oxide	AA
RJ101	VRS-CY1JF000J	J	00	1/16W	Metal Oxide	AA
RJ102	VRS-CY1JF000J	J	00	1/16W	Metal Oxide	AA
RJ103	VRS-CY1JF000J	J	00	1/16W	Metal Oxide	AA
RJ104	VRS-CY1JF000J	J	00	1/16W	Metal Oxide	AA
RJ105	VRS-CY1JF000J	J	00	1/16W	Metal Oxide	AA
RJ106	VRS-CY1JF000J	J	00	1/16W	Metal Oxide	AA
RJ107	VRS-CY1JF000J	J	00	1/16W	Metal Oxide	AA
RJ108	VRS-CY1JF000J	J	00	1/16W	Metal Oxide	AA
RJ109	VRS-CY1JF000J	J	00	1/16W	Metal Oxide	AA
RJ111	VRS-CY1JF000J	J	00	1/16W	Metal Oxide	AA
RJ115	VRS-CY1JF000J	J	00	1/16W	Metal Oxide	AA
RJ118	VRS-CY1JF000J	J	00	1/16W	Metal Oxide	AA

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Ref. No.	Part No.	★	Description	Code
RJ130	VRS-CY1JF000J	J	00 1/16W Metal Oxide	AA
RJ131	VRS-CY1JF000J	J	00 1/16W Metal Oxide	AA
RJ132	VRS-CY1JF000J	J	00 1/16W Metal Oxide	AA
RJ134	VRS-CY1JF000J	J	00 1/16W Metal Oxide	AA
RJ135	VRS-CY1JF000J	J	00 1/16W Metal Oxide	AA
R209	VRD-RA2BE474J	J	470k 1/8W Carbon	AA
R212	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA
R213	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R214	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R215	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
R217	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R218	VRS-CY1JF000J	J	00 1/16W Metal Oxide	AA
R219	VRS-CY1JF122J	J	1.2k 1/16W Metal Oxide	AA
R220	VRD-RA2BE152J	J	1.5k 1/8W Carbon	AA
R225	VRS-CY1JF000J	J	00 1/16W Metal Oxide	AA
R227	VRS-CY1JF000J	J	00 1/16W Metal Oxide	AA
R228	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R229	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R230	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R231	VRD-RA2BE395J	J	3.9M 1/8W Carbon (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
R261	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R301	VRD-RA2BE682J	J	6.8k 1/8W Carbon	AA
R304	VRD-RA2BE822J	J	8.2k 1/8W Carbon	AA
R305	VRD-RA2BE182J	J	1.8k 1/8W Carbon (VC-MA223R, VC-MA33A/B/D/K/L/S/W)	AA
R305	VRD-RA2BE821J	J	820 1/8W Carbon (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
R306	VRD-RA2BE103J	J	10k 1/8W Carbon (VC-MA223R, VC-MA33A/B/D/K/L/S/W)	AA
R307	VRS-CY1JF473J	J	47k 1/16W Metal Oxide (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
R308	VRD-RA2BE473J	J	47k 1/8W Carbon (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
R309	VRS-CY1JF470J	J	47 1/16W Metal Oxide (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
R310	VRD-RA2BE470J	J	47 1/8W Carbon (VC-MA443R , VC-MA55A/B/D/K/L/S/W)	AA
R311	VRS-CY1JF332J	J	3.3k 1/16W Metal Oxide (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
R312	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
R313	VRS-CY1JF102J	J	1k 1/16W Metal Oxide (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
R314	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
R315	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
R316	VRS-CY1JF103J	J	10k 1/16W Metal Oxide (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
R321	VRS-CY1JF000J	J	00 1/16W Metal Oxide	AA
R323	VRD-RA2BE103J	J	10k 1/8W Carbon (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
R324	VRS-CY1JF000J	J	00 1/16W Metal Oxide	AA
R326	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
R330	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R331	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R332	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA
R333	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA
R334	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R341	VRD-RA2BE470J	J	47 1/8W Carbon (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
R342	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide (VC-MA443R , VC-MA55A/B/D/K/L/S/W)	AA
R343	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide (VC-MA443R , VC-MA55A/B/D/K/L/S/W)	AA
R344	VRD-RA2BE472J	J	4.7k 1/8W Carbon (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
R345	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
R401	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R402	VRS-CY1JF821J	J	820 1/16W Metal Oxide	AA
R403	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA
R404	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R405	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
R406	VRD-RA2BE331J	J	330 1/8W Carbon	AA
R407	VRS-CY1JF182J	J	1.8k 1/16W Metal Oxide	AA
R408	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R409	VRS-CY1JF101J	J	100 1/16W Metal Oxide	AA
R410	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R411	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R412	VRS-CY1JF821J	J	820 1/16W Metal Oxide	AA
R413	VRD-RA2BE821J	J	820 1/8W Carbon	AA
R414	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA
R415	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R416	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA

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MAIN UNIT (Continued)

Ref. No.	Part No.	★	Description	Code
R417	VRS-CY1JF332J	J	3.3k 1/16W Metal Oxide	AA
R418	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
R419	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R420	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide	AA
R421	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R422	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R423	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
R424	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R425	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R426	VRS-CY1JF822J	J	8.2k 1/16W Metal Oxide	AA
R427	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R428	VRD-RA2BE471J	J	470 1/8W Carbon	AA
R429	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA
R431	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R432	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R433	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R434	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R435	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R436	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA
R437	VRS-CY1JF335J	J	3.3M 1/16W Metal Oxide	AA
R438	VRD-RA2BE335J	J	3.3M 1/8W Carbon	AA
R440	VRD-RA2BE335J	J	3.3M 1/8W Carbon	AA
R443	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R444	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R490	VRD-RA2BE821J	J	820 1/8W Carbon	AA
R501	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R502	VRS-CY1JF821J	J	820 1/16W Metal Oxide	AA
R506	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R507	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R508	VRS-CY1JF122J	J	1.2k 1/16W Metal Oxide	AA
R510	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA
R511	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R513	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R514	VRS-CY1JF000J	J	00 1/16W Metal Oxide	AA
R517	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
R520	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R523	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R524	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R525	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R540	VRS-CY1JF103J	J	10k 1/16W Metal Oxide (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
R601	VRS-CY1JF100J	J	10 1/16W Metal Oxide	AA
R631	VRS-CY1JF470J	J	47 1/16W Metal Oxide	AA
R632	VRS-CY1JF682J	J	6.8k 1/16W Metal Oxide	AA
R633	VRG-SC2EB4R7J	J	4.7 1/4W Fuse Resistor	AB
R635	VRD-RA2BE273J	J	27k 1/8W Carbon	AA
R643	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R701	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R705	VRS-CY1JF155J	J	1.5M 1/16W Metal Oxide	AA
R706	VRS-CY1JF000J	J	00 1/16W Metal Oxide	AA
R707	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R708	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R709	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R710	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R711	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R713	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R714	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide	AA
R715	VRS-CY1JF682J	J	6.8k 1/16W Metal Oxide	AA
R716	VRS-CY1JF393J	J	39k 1/16W Metal Oxide	AA
R717	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA
R718	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R719	VRS-CY1JF823J	J	82k 1/16W Metal Oxide	AA
R720	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA
R723	VRS-CY1JF154J	J	150k 1/16W Metal Oxide	AA
R724	VRS-CY1JF154J	J	150k 1/16W Metal Oxide	AA
R725	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA
R726	VRS-CY1JF564J	J	560k 1/16W Metal Oxide	AA
R727	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R728	VRS-CY1JF224J	J	220k 1/16W Metal Oxide	AA
R729	VRS-CY1JF683J	J	68k 1/16W Metal Oxide	AA
R730	VRS-CY1JF334J	J	330k 1/16W Metal Oxide	AA
R731	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
R732	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R733	VRS-CY1JF155J	J	1.5M 1/16W Metal Oxide	AA
R734	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R735	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R736	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R737	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R738	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R739	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R741	VRS-CY1JF563J	J	56k 1/16W Metal Oxide	AA
R742	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R743	VRS-CY1JF564J	J	560k 1/16W Metal Oxide	AA
R746	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
R748	VRD-RA2BE223J	J	22k 1/8W Carbon	AA
R752	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R753	VRS-CY1JF000J	J	00 1/16W Metal Oxide	AA
R790	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R791	VRS-CY1JF155J	J	1.5M 1/16W Metal Oxide	AA
R792	VRS-CY1JF154J	J	150k 1/16W Metal Oxide	AA
R793	VRS-CY1JF224J	J	220k 1/16W Metal Oxide	AA
R801	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R802	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R803	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R804	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R805	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R806	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R807	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R809	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R811	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R812	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R813	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R814	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R815	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R821	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R822	VRD-RA2BE183J	J	18k 1/8W Carbon	AA
R824	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R825	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA

DUNTK5270WEV4/5/E/F
MAIN UNIT (Continued)

Ref. No.	Part No.	★	Description	Code
R826	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R827	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R830	VRS-CY1JF000J	J	00 1/16W Metal Oxide (VC-MA223R, VC-MA33A/B/D/K/L/S/W)	AA
R831	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R832	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R840	VRG-SC2EB2R2J	J	2.2 1/4W Fuse Resistor	AC
R841	VRG-SC2EB1R0J	J	1 1/4W Fuse Resistor	AB
R851	VRD-RA2EE151J	J	150 1/4W Carbon	AA
R854	VRD-RA2BE123J	J	12k 1/8W Carbon	AA
R855	VRD-RA2BE123J	J	12k 1/8W Carbon	AA
R856	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R857	VRD-RA2BE271J	J	270 1/8W Carbon	AA
R858	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R859	VRD-RA2BE271J	J	270 1/8W Carbon	AA
R860	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R861	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R862	VRD-RA2BE154J	J	150k 1/8W Carbon	AA
R863	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R864	VRS-CY1JF154J	J	150k 1/16W Metal Oxide	AA
R865	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R866	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R867	VRS-CY1JF102J	J	1k 1/16W Metal Oxide (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
⚠R901	VRD-RA2HD105J	J	1 M 1/2W Carbon	AA
⚠R902	VRC-UA2HG685K	J	6.8M 1/2W Solid	AA
⚠R903	VRC-UA2HG685K	J	6.8M 1/2W Solid	AA
⚠R904	RR-WZ0002GEZZ	J	Resistor	AD
⚠R905	RR-SZ0006GEZZ	J	Resistor	AD
⚠R906	VRD-RA2HD224J	J	220k 1/2W Carbon	AA
⚠R907	VRD-RA2HD224J	J	220k 1/2W Carbon	AA
⚠R908	VRS-VV3AB470J	J	47 1W Metal Oxide	AA
⚠R909	RR-SZ0005GEZZ	J	Resistor	AD
⚠R915	VRD-RA2EE101J	J	100 1/4W Carbon	AA
⚠R916	VRD-RA2EE821J	J	820 1/4W Carbon	AA
⚠R921	VRG-SC2EB1R0J	J	1 1/4W Fuse Resistor	AB
R922	VRD-RA2HD100J	J	10 1/2W Carbon	AA
⚠R924	VRG-SC2EB100J	J	10 1/4W Fuse Resistor	AB
R925	VRD-RA2BE221J	J	220 1/8W Carbon	AA
R926	VRS-CY1JF221J	J	220 1/16W Metal Oxide	AA
R927	VRD-RA2BE272J	J	2.7k 1/8W Carbon	AA
R928	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R929	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA
R930	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
R931	VRS-CY1JF682J	J	6.8k 1/16W Metal Oxide	AA
R932	VRS-CY1JF221J	J	220 1/16W Metal Oxide	AA
R933	VRD-RA2BE222J	J	2.2k 1/8W Carbon	AA
R952	VRD-RA2HD561J	J	560 1/2W Carbon	AA
R963	VRS-CY1JF330J	J	33 1/16W Metal Oxide	AA
R964	VRD-RA2HD392J	J	3.9k 1/2W Carbon	AA
R965	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R966	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R967	VRD-RA2BE183J	J	18k 1/8W Carbon	AA
R971	VRD-RA2HD561J	J	560 1/2W Carbon	AA
R972	VRD-RA2BER56J	J	0.56 1/8W Carbon	AA
R973	VRD-RA2BER56J	J	0.56 1/8W Carbon	AA
R976	VRD-RA2BE472J	J	4.7k 1/8W Carbon	AA
R979	VRD-RA2EE561J	J	560 1/4W Carbon	AA
R980	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R981	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA
R982	VRD-RA2EE391J	J	390 1/4W Carbon	AA
R983	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA
R989	VRD-RA2BE333J	J	33k 1/8W Carbon	AA
R1551	VRS-CY1JF334J	J	330k 1/16W Metal Oxide	AA
R1552	VRS-CY1JF474J	J	470k 1/16W Metal Oxide	AA
R1553	VRS-CY1JF101J	J	100 1/16W Metal Oxide	AA
R2203	VRS-CY1JF391J	J	390 1/16W Metal Oxide	AA
R2401	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
R2402	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA
R2403	VRS-CY1JF154J	J	150k 1/16W Metal Oxide	AA
R2404	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R2405	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R2406	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R2410	VRS-CY1JF684J	J	680k 1/16W Metal Oxide	AA
R4401	VRD-RA2BE181J	J	180 1/8W Carbon	AA
R4402	VRD-RA2BE151J	J	150 1/8W Carbon	AA
R4403	VRD-RA2BE750J	J	75 1/8W Carbon	AA
R4404	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
R4405	VRS-CY1JF101J	J	100 1/16W Metal Oxide	AA
R4407	VRS-CY1JF332J	J	3.3k 1/16W Metal Oxide	AA
R5001	VRD-RA2BE472J	J	4.7k 1/8W Carbon	AA
R5002	VRD-RA2EE1R0J	J	1 1/4W Carbon	AA
R5003	VRD-RA2BE393J	J	39k 1/8W Carbon	AA
R5004	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R5005	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R5006	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R5007	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R5008	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R5009	VRS-CY1JF000J	J	00 1/16W Metal Oxide	AA
R5010	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R5501	VRD-RA2BE331J	J	330 1/8W Carbon	AA
R5901	VRD-RA2BE181J	J	180 1/8W Carbon	AA
R5902	VRD-RA2BE181J	J	180 1/8W Carbon	AA
R5904	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R5970	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R6609	VRS-CY1JF000J	J	00 1/16W Metal Oxide	AA
R6613	VRD-RA2BE331J	J	330 1/8W Carbon	AA
R6614	VRD-RA2BE681J	J	680 1/8W Carbon	AA
R6615	VRD-RA2BE332J	J	3.3k 1/8W Carbon	AA
R6618	VRD-RA2BE682J	J	6.8k 1/8W Carbon	AA
R6620	VRD-RA2BE681J	J	680 1/8W Carbon	AA
R6654	VRD-RA2BE682J	J	6.8k 1/8W Carbon	AA
R6655	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R6657	VRD-RA2BE333J	J	33k 1/8W Carbon	AA

Ref. No.	Part No.	★	Description	Code

DUNTK5270WEV4/5/E/F
MAIN UNIT (Continued)

SWITCHES

S5001	QSW-K0002AJZZ	J	POWER (VC-MA33A/B/D/K/L/S/W)	AD
S5002	QSW-K0002AJZZ	J	POWER (VC-MA223R, VC-MA443R , VC-MA55A/B/D/K/L/S/W)	AD
S5003	QSW-K0002AJZZ	J	MENU (VC-MA223R, VC-MA443R , VC-MA55A/B/D/K/L/S/W)	AD
S5004	QSW-K0002AJZZ	J	MENU/SET	AD
S5005	QSW-K0002AJZZ	J	SET (VC-MA33A/B/D/K/L/S/W)	AD

MISCELLANEOUS PARTS

⚠	QACCV2007AJZZ	J	AC Cord (VC-MA223R/443R, VC-MA33A/B/L/K, VC-MA55A/B/L/K)	AS
⚠	QACCZ3007AJZZ	J	AC Cord (VC-MA33S/D, VC-MA55S/D)	AS
⚠	QACCB5004AJZZ	J	AC Cord (VC-MA33W, VC-MA55W)	AS
CN1501	QCNW-0284AJZZ	J	Connecting Cord	
CNV4451	RCNVR0003AJN6		Converter (VC-MA33W , VC-MA55W)	BK
CNV4451	RCNVR0003AJZZ	J	Converter (Except VC-MA33W, VC-MA55W)	BA
DG5001	VVK10BT143G-1		Display	AV
⚠F901	QFS-C2025CEZZ	J	Fuse T2A 250V	AQ
FB801	RBLN-0013GEZZ	J	Ferrite Bead	AB
FB901	RBLN-0043CEZZ	J	Ferrite Bead	AB
FB902	RBLN-0043CEZZ	J	Ferrite Bead	AB
FB4402	RBLN-0043CEZZ	J	Ferrite Bead (VC-MA33A/B/D/K/L/S/W , VC-MA55A/B/D/K/L/S/W)	AB
FH901	QFSHD1013CEZZ	J	Fuse Holder	AC
FH902	QFSHD1014CEZZ	J	Fuse Holder	AC
J6601	QJAKH0016GEZZ	J	Jack	AL
P301	QPLGN0347REZZ	J	Plug	AA
P401	QPLGN0347REZZ	J	Plug	AA
P601	QPLGN0247REZZ	J	Plug 2-pin (AE)	AA
P701	QPLGZ0631GEZZ	J	Plug 6-pin (AO)	AA
P702	QPLGN0247REZZ	J	Plug 2-pin (AL)	AA
P703	QPLGN0247REZZ	J	Plug	AA
P704	QPLGZ0974GEZZ	J	Plug 9-pin (AC)	AD
⚠P901	QPLGN0269GEZZ	J	Plug 3-pin (PA)	AB
P1551	QPLGN0447REZZ	J	Plug	AA
P4402	QPLGZ1431GEZZ	J	Plug 14-pin (AR)	AC
P4404	QPLGZ0331GEZZ	J	Plug 3-pin (AT)	AB
P5002	QPLGN0247REZZ	J	Plug	AA
P5005	QPLGN0247REZZ	J	Plug	AA
SC601	QSOCN0684REZZ	J	Socket 6-pin (AA)	AB
SC701	QSOCN0795REZZ	J	Socket 7-pin (AD)	AC
SC6602	QSOCZ1431GEZZ	J	Socket 14-pin (JB)	AD
SC6604	QSOCZ0331GEZZ	J	Socket 3-pin (JG)	AC
RMC5501	RRMCU0056GEZZ	J	Remote Control Receiver	AQ
W851	LHLDZ1962AJ00		Holder	AD
W852	LHLDZ1962AJ00		Holder	AD

DUNTK5284TEV0
OPERATION UNIT

SWITCHES

S8801	QSW-K0002AJZZ	J	STOP/EJECT	AD
S8802	QSW-K0002AJZZ	J	PLAY	AD
S8803	QSW-K0079GEZZ	J	REC	AB
S8804	QSW-K0002AJZZ	J	PAUSE/STILL	AD
S8805	QSW-K0079GEZZ	J	Channel UP	AB
S8806	QSW-K0079GEZZ	J	Channel DOWN	AB
S8807	QSW-Z0001AJZZ	J	SHUTTLE Switch	AQ

MISCELLANEOUS PARTS

SC8801	QSOCZ0631GEZZ	J	Socket 6-pin (OA)	AB

DUNTK5281TEV3/4
TERMINAL UNIT

Ref. No.	Part No.	★	Description	Code
INTEGRATED CIRCUITS				
IC601	VHiBA7795LS-1	J	BA7795LS	AG
TRANSISTORS				
Q601	VS2C1740SQR1E	J	2SC1740S	AC
Q602	VS2C1740SQR1E	J	2SC1740S	AC
Q605	VSDTC114ES/-1	J	DTC114E	AB
DIODES				
D2201	RH-EX0168GEZZ	J	Zener Diode	AA
D4401	RH-EX0168GEZZ	J	Zener Diode	AA
COIL				
L601	VP-YF822J0000		Peaking 8.2mH	AC
CAPACITORS				
C601	VCKYPA1HB152K	J	1500p 50V Ceramic	AA
C603	VCEAEA1HW335M	J	3.3 50V Electrolytic	AB
C604	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C605	RC-QZA123TAYK	J	Capacitor	
C606	VCKYPA1HB272K	J	2700p 50V Ceramic	AA
C607	VCEAEA1CW476M	J	47 16V Electrolytic	AB
C608	VCEAEA1HW104M	J	0.1 50V Electrolytic	AB
C609	VCEAEA1HW104M	J	0.1 50V Electrolytic	AB
C610	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C611	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C612	RC-QZA392TAYJ	J	Capacitor	AB
C613	RC-QZA223TAYJ	J	Capacitor (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AB
C614	VCKYD41HB151K	J	150p 50V Ceramic	AA
C615	VCKYD41HB151K	J	150p 50V Ceramic	AA
C616	VCKYD41HB331K	J	330p 50V Ceramic	AA
C617	VCCSD41HL220J	J	22p 50V Ceramic	AA
C618	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C619	VCKYD41HB821K	J	820p 50V Ceramic	AA
C626	RC-KZ0029GEZZ	J	Capacitor	AA
C2201	VCEAEA1HW335M	J	3.3 50V Electrolytic	AB
C2202	VCE9EM1HW335M	J	3.3 50V Elect. (N.P)	AD
C4403	VCEA2A0JW477M	J	470 6.3V Electrolytic	AB
RESISTORS				
R602	VRD-RA2BE333J	J	33k 1/8W Carbon	AA
R603	VRD-RA2BE221J	J	220 1/8W Carbon	AA
R604	VRD-RA2BE274J	J	270k 1/8W Carbon	AA
R605	VRD-RA2BE682J	J	6.8k 1/8W Carbon	AA
R606	VRD-RA2BE682J	J	6.8k 1/8W Carbon (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
R609	VRD-RA2BE332J	J	3.3k 1/8W Carbon	AA
R610	VRD-RA2BE225J	J	2.2M 1/8W Carbon	AA
R611	VRD-RA2BE473J	J	47k 1/8W Carbon	AA
R612	VRD-RA2BE562J	J	5.6k 1/8W Carbon	AA

Ref. No.	Part No.	★	Description	Code
R615	VRD-RA2BE823J	J	82k 1/8W Carbon	AA
R616	VRD-RA2BE183J	J	18k 1/8W Carbon	AA
R617	VRD-RA2BE152J	J	1.5k 1/8W Carbon	AA
R618	VRD-RA2BE183J	J	18k 1/8W Carbon	AA
R619	VRD-RA2BE471J	J	470 1/8W Carbon	AA
R620	VRD-RA2BE3911J	J	390 1/8W Carbon (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	AA
R621	VRD-RA2BE683J	J	68k 1/8W Carbon	AA
R622	VRD-RA2BE683J	J	68k 1/8W Carbon	AA
R623	VRD-RA2BE333J	J	33k 1/8W Carbon	AA
R624	VRD-RA2BE563J	J	56k 1/8W Carbon	AA
R625	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R626	VRD-RA2BE332J	J	3.3k 1/8W Carbon	AA
R629	VRD-RA2BE153J	J	15k 1/8W Carbon	AA
R630	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R636	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R637	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R638	VRD-RA2BE562J	J	5.6k 1/8W Carbon	AA
R639	VRD-RA2BE153J	J	15k 1/8W Carbon	AA
R644	VRD-RA2BE101J	J	100 1/8W Carbon	AA
R2201	VRD-RA2BE750J	J	75 1/8W Carbon	AA
R2202	VRD-RA2BE391J	J	390 1/8W Carbon	AA
MISCELLANEOUS PARTS				
SC301	QSOCN0494REZZ	J	Socket 4-pin (AH) (VC-MA223R, VC-MA33A/B/D/K/L/S/W)	AC
SC301	QSOCN0799REZZ	J	Socket 7-pin (AH) (VC-MA443R, VC-MA55A/B/D/K/L/S/W)	

MECHANISM CHASSIS

Ref. No.	Part No.	★	Description	Code
1	LBNDK1009AJZZ	V	Tension Band Ass'y	AH
	LBNDK1009GEZZ	J	Tension Band Ass'y (Only for VC-MA223R/443R)	AT
2	LBOSZ1001AJZZ	V	Tension Arm Boss	AB
	LBOSZ1001GEZZ	J	Tension Arm Boss (Only for VC-MA223R/443R)	AT
3	LBOSZ1002AJZZ	V	Slow Brake Boss	AD
	LBOSZ1002GEZZ	J	Slow Brake Boss (Only for VC-MA223R/443R)	AR
4	LBOSZ1003AJZZ	V	Cassette Stay L	AC
	LBOSZ1003GEZZ	J	Cassette Stay L (Only for VC-MA223R/443R)	AR
5	LCHSM0158AJZZ	V	Main Chassis Ass'y	BA
	LCHSM0158GEZZ	J	Main Chassis Ass'y (Only for VC-MA223R/443R)	AY
6	LHLDZ1958AJZZ	V	Loading Motor Block	AG
	LHLDZ1958GEZZ	J	Loading Motor Block (Only for VC-MA223R/443R)	AR
7	LPOLM0056GEZZ	J	Supply Pole Base Ass'y	AM
8	LPOLM0057GEZZ	J	Take Up Pole Base Ass'y	AM
9	MLEVF0459AJZZ	V	Take-Up Loading Arm Ass'y	AF
	MLEVF0459GEZZ	J	Take-Up Loading Arm Ass'y (Only for VC-MA223R/443R)	AS
10	MLEVF0461AJZZ	V	Supply Loading Arm Ass'y	AF
	MLEVF0461GEZZ	J	Supply Loading Arm Ass'y (Only for VC-MA223R/443R)	AS
11	MLEVF0463AJZZ	V	Pinch Drive Lever Ass'y	AU
	MLEVF0463GEZZ	J	Pinch Drive Lever Ass'y (Only for VC-MA223R/443R)	AS
12	MLEVF0464GEZZ	J	Pinch Roller Lever Ass'y	AW
15	MLEVF0467AJZZ	V	Tension Arm Ass'y	AK
	MLEVF0467GEZZ	J	Tension Arm Ass'y (Only for VC-MA223R/443R)	AS
16	MLEVF0468AJFW	V	Audio/Control Head Arm	AG
	MLEVF0468GEFW	V	Audio/Control Head Arm (Only for VC-MA223R/443R)	AS
17	MLEVP0271AJZZ	V	Sifter Drive Lever	AE
	MLEVP0271GEZZ	J	Sifter Drive Lever (Only for VC-MA223R/443R)	AS
18	MLEVP0272AJZZ	V	Pinch Double Action Lever	AD
	MLEVP0272GEZZ	J	Pinch Double Action Lever (Only for VC-MA223R/443R)	AS
19	MLEVP0273AJZZ	V	Reverse Guide Lever Ass'y	AL
	MLEVP0273GEZZ	J	Reverse Guide Lever Ass'y (Only for VC-MA223R/443R)	AT
20	MLEVP0275AJZZ	V	Reverse Drive Lever	AD
	MLEVP0275GEZZ	J	Reverse Drive Lever (Only for VC-MA223R/443R)	AB
21	MLEVP0276AJZZ	V	Slow Brake	AE
	MLEVP0276GEZZ	J	Slow Brake (Only for VC-MA223R/443R)	AS
22	MLEVP0277AJZZ	V	Open Lever	AD
	MLEVP0277GEZZ	J	Open Lever (Only for VC-MA223R/443R)	AS
23	MLEVP0278AJZZ	V	Clutch Lever	AE
	MLEVP0278GEZZ	J	Clutch Lever (Only for VC-MA223R/443R)	AS
24	MLEVP0279AJZZ	V	Sup Main Brake Ass'y	AF
	MLEVP0279GEZZ	J	Sup Main Brake Ass'y (Only for VC-MA223R/443R)	AS
25	MLEVP0280AJZZ	V	Take-Up Main Brake Ass'y	AF
	MLEVP0280GEZZ	J	Take-Up Main Brake Ass'y (Only for VC-MA223R/443R)	AS
26	CLEVP0287AJZZ	V	Auto Head Cleaner Ass'y	AG
	CLEVP0287GEZZ	J	Auto Head Cleaner Ass'y (Only for VC-MA223R/443R)	AF
27	MSLIP0008AJZZ	V	Sifter (VC-MA55A/B/D/K/L/S/W, VC-MA443R)	AH
28	MSPRC0205AJFJ	V	Audio/Control Head Spring	AB
	MSPRC0205GEFJ	V	Audio/Control Head Spring (Only for VC-MA223R/443R)	AR
29	MSPRD0165AJFJ	V	Reverse Guide Spring	AE
	MSPRD0165GEFJ	V	Reverse Guide Spring (Only for VC-MA223R/443R)	AR
30	MSPRT0402AJFJ	V	Loading Double Action Spring	AE
	MSPRT0402GEFJ	V	Loading Double Action Spring (Only for VC-MA223R/443R)	AR
31	MSPRT0403AJFJ	V	Pinch Double Action Spring	AD
	MSPRT0403GEFJ	V	Pinch Double Action Spring (Only for VC-MA223R/443R)	AR
33	MSPRT0405AJFJ	V	Tension Spring	AE
	MSPRT0405GEFJ	V	Tension Spring (Only for VC-MA223R/443R)	AR
34	NBLTK0066AJ00	V	Drive Belt	AE
35	NDAIV1070AJ00	V	Reel Disk	AE
	NDAIV1070GE00	V	Reel Disk (Only for VC-MA223R/443R)	AS
36	NGERH1267AJZZ	V	Loading Connect Gear	AD

MECHANISM CHASSIS
(Continued)

Ref. No.	Part No.	★	Description	Code
	NGERH1267GEZZ	J	Loading Connect Gear (Only for VC-MA223R/443R)	AS
37	NGERH1268AJ00	V	Master Cam	AE
	NGERH1268GE00	J	Master Cam (Only for VC-MA223R/443R)	AS
38	NGERH1269AJZZ	V	Casecon Drive Gear	AD
	NGERH1269GEZZ	J	Casecon Drive Gear (Only for VC-MA223R/443R)	AS
39	NGERH1270AJZZ	V	Take-Up Loading Gear	AF
	NGERH1270GEZZ	J	Take-Up Loading Gear (Only for VC-MA223R/443R)	AS
40	NGERH1271AJZZ	V	Supply Loading Gear	AD
	NGERH1271GEZZ	J	Supply Loading Gear (Only for VC-MA223R/443R)	AS
41	NGERH1272AJZZ	V	Pinch Drive Cam	AE
	NGERH1272GEZZ	J	Pinch Drive Cam (Only for VC-MA223R/443R)	AQ
42	NGERH1275AJZZ	V	Supply Reel Relay Gear	AE
	NGERH1275GEZZ	J	Supply Reel Relay Gear (Only for VC-MA223R/443R)	AS
43	NGERH1276AJZZ	V	Take-Up Reel Relay Gear	AE
	NGERH1276GEZZ	J	Take-Up Reel Relay Gear (Only for VC-MA223R/443R)	AS
44	NGERW1062AJZZ	V	Worm Gear	AD
	NGERW1062GEZZ	J	Worm Gear (Only for VC-MA223R/443R)	AS
45	NGERW1063AJZZ	V	Worm Wheel Gear	AD
	NGERW1063GEZZ	J	Worm Wheel Gear (Only for VC-MA223R/443R)	AS
46	NiDR-0015AJZZ	V	Idler Wheel Ass'y	AK
	NiDR-0015GEZZ	J	Idler Wheel Ass'y (Only for VC-MA223R/443R)	AS
47	NPLYV0155AJZZ	V	Motor Pully	AB
	NPLYV0155GEZZ	J	Motor Pully (Only for VC-MA223R/443R)	AR
48	NPLYV0156AJZZ	V	Limitter Pulley Ass'y	AM
	NPLYV0156AJZZ	V	Limitter Pulley Ass'y (Only for VC-MA223R/443R)	AU
49	NROLP0110GEZZ	J	Guide Roller	AH
50	NSFTP0034AJZZ	V	Tension Pole Adjuster	AB
	NSFTP0034GEZZ	J	Tension Pole Adjuster (Only for VC-MA223R/443R)	AA
51	PGUMM0043AJZZ	V	Damper Raber	AD
	PGUMM0043GEZZ	J	Damper Raber (Only for VC-MA223R/443R)	AB
52	PREFL1007AJZZ	V	Light Guide	AE
	PREFL1007GEZZ	J	Light Guide (Only for VC-MA223R/443R)	AR
53	QCNW-0247AJZZ	V	FFC for Drum Motor	AG
	QCNW-0247GEZZ	J	FFC for Drum Motor (Only for VC-MA223R/443R)	AF
54	QCNW-0271AJZZ	V	Lead Wire for Loading Motor	AD
	QCNW-7501GEZZ	J	Lead Wire for Loading Motor (Only for VC-MA223R/443R)	AD
55	QCNW-0272AJZZ	V	FFC for Audio/Control Head	AF
	QCNW-0272GEZZ	J	FFC for Audio/Control Head (Only for VC-MA223R/443R)	AF
56	QPWBF5243AJZZ	V	Audio/Control Head PWB	AE
	QPWBF5243GEZZ	J	Audio/Control Head PWB (Only for VC-MA223R/443R)	AE
57	QSOCN0685REZZ	J	Socket, 6 pin	AB
58	RHEDT0031AJZZ	J	Full Erase Head	AX
	RHEDT0031GEZZ	J	Full Erase Head (Only for VC-MA223R/443R)	AH
59	RHEDU0085GEZZ	J	Audio/Control Head Ass'y	BA
60	RMOTM1062GEZZ	J	Loading Motor	AP
61	RMOTN2053GEZZ	J	Capstan Motor	BF
62	RMOTP1129GEZZ	J	Drum Drive Motor	AX
63	DDRMW0014TEX1	V	Upper and lower drum Ass'y	BQ
63	DDRMW0014TEX5	V	Upper and lower drum Ass'y (VC-MA55A/B/D/K/L/S/W, VC-MA443i/R)	BQ
64	MSPRC0194GEFJ	J	Drum Earth Brush Spring	AA
65	QBRSK0034GEZZ	J	Drum Earth Brush	AD
66	XBPSD26P05J00	J	Drum Drive Motor Mounting Screw (SW2.6P+5S)	AA
67	PGIDC0055GEFW	J	Drum Base	AL

CASSETTE HOUSING CONTROL

Ref. No.	Part No.	★	Description	Code
300	CHLDX3074TEV0	V	Cassette Housing Control Ass'y	AX
	CHLDX3074GE02	V	Cassette Housing Control Ass'y (Only for VC-MA223R/443R)	AX
301	LANGF9592AJFW	V	Upper Plate	AL
	LANGF9592GEFW	V	Upper Plate (Only for VC-MA223R/443R)	AL
302	LHLDX1028AJ00	V	Frame (L)	AH
	LHLDX1028GE00	V	Frame (L) (Only for VC-MA223R/443R)	
303	LHLDX1029AJ00	V	Frame (R)	AH
	LHLDX1029GE00	V	Frame (R) (Only for VC-MA223R/443R)	
304	LHLDX1030AJZZ	V	Holder (L)	AE
	LHLDX1030GEZZ	V	Holder (L) (Only for VC-MA223R/443R)	
305	LHLDX1031AJZZ	V	Holder (R)	AE
	LHLDX1031GEZZ	V	Holder (R) (Only for VC-MA223R/443R)	
306	MLEVF0469AJFW	V	Proof Lever (R)	AE
	MLEVF0469GEFW	V	Proof Lever (R) (Only for VC-MA223R/443R)	AQ
307	MLEVP0281AJ00	V	Door Open Lever	AD
	MLEVP0281GE00	V	Door Open Lever (Only for VC-MA223R/443R)	AQ
308	MSLIF0073AJFW	V	Slider	AN
	MSLIF0073GEFW	V	Slider (Only for VC-MA223R/443R)	AR
309	MSPRD0151AJFJ	V	Proof Lever (R) Spring	AB
	MSPRD0151AJFJ	V	Proof Lever (R) Spring (Only for VC-MA223R/443R)	AB
310	MSPRD0166AJFJ	V	Drive Gear (R) Spring	AN
	MSPRD0166GEFJ	V	Drive Gear (R) Spring (Only for VC-MA223R/443R)	
311	MSPRP0175AJFJ	V	Cassette Spring	AE
	MSPRP0159GEFJ	V	Cassette Spring (Only for VC-MA223R/443R)	AE
312	MSPRT0381AJFJ	V	Drive Angle Gear	AC
	MSPRT0381GEFJ	V	Drive Angle Gear (Only for VC-MA223R/443R)	AB
313	NGERH1278AJZZ	V	Drive Gear L	AE
	NGERH1278GEZZ	V	Drive Gear L (Only for VC-MA223R/443R)	AQ
314	NGERH1279AJZZ	V	Drive Gear R	AE
	NGERH1279GEZZ	V	Drive Gear R (Only for VC-MA223R/443R)	AQ
315	NGERR1008AJ00	V	Double Action Rack Gear	AE
	NGERR1008GE00	V	Double Action Rack Gear (Only for VC-MA223R/443R)	AQ
316	NGERR3005AJFW	V	Drive Angle Gear	AG
	NGERR3005GEFW	V	Drive Angle Gear (Only for VC-MA223R/443R)	AQ
317	NSFTD0041AJFD	V	Main Shaft	AH
	NSFTD0041GEFD	V	Main Shaft (Only for VC-MA223R/443R)	AF

SCREW, NUTS AND WASHERS

Ref. No.	Part No.	★	Description	Code
200	LX-XZ3030GEFD	J	Screw	AC
201	LX-BZ3176GEZZ	J	Screw	AD
202	LX-HZ3082GEZZ	J	Audio/Control Head Screw	AD
203	XHPSD26P06000	J	Screw, C2.6P+6S (For Capstan Motor)	AA
204	XBPSD30P05J00	J	Screw, SW2.6P+5S (Loading Motor)	AA
205	XHPSD26P06WS0	J	Screw, C2.6P+6S (For Loading Motor Block)	AA
206	XHPSD26P08WS0	J	Screw, C2.6P+8S (For F/E Head)	AA
207	XHPSD30P08WS0	J	Screw, C3.0P+8S (For Drum Base)	AA
208	XRESJ40-06000	J	E-Ring, E-4	AA
209	XWHJZ52-05095	J	Washer, W5.2-9.5-0.5	AD
210	XWHJZ52-03095	J	Washer, W5.2-9.5-0.3	AD
211	XWHJZ52-04095	J	Washer, W5.2-9.5-0.4	AD
212	XWHJZ52-06095	J	Washer, W5.2-9.5-0.6	AD
213	XWHJZ52-07095	J	Washer, W5.2-9.5-0.7	AD
214	PSPAP0009AJZZ	V	Reverse Guide Adjusting Nut	AB
	PSPAP0009GEZZ	V	Reverse Guide Adjusting Nut (Only for VC-MA223R/443R)	AB
215	LX-WZ1003GE00	J	Cut Washer	AA
216	LX-WZ1041GE00	J	Cut Washer	AA
217	LX-WZ1073GE00	J	Cut Washer	AB
218	XBPSD30P08J00	J	Drum Base Mounting Screw (SW3P+8S)	AA

Ref. No.	Part No.	★	Description	Code

MECHANICAL PARTS

601	GCABB1165AJZZ	V	Main Frame	AV
602	GCOVA1972AJZZ	V	Antenna Terminal Cover	AN
603	GCABA3102AJS3	V	Top Cabinet (VC-MA33A/B/D/K/L/S/W , VC-MA55A/B/D/K/L/S/W)	
603	GCABA3102AJSF	V	Top Cabinet (VC-MA223R, VC-MA443R)	AY
604	GBDYU3098AJFW	V	Bottom Plate (VC-MA33A/B/D/K/L/S/W , VC-MA55A/B/D/K/L/S/W)	AP
604	GBDYU3098GEFW	V	Bottom Plate (VC-MA223R, VC-MA443R)	AL
605	LANGQ9065AJFW	V	Top Cabinet Fixing Angle(L)	AE
606	LANGQ9063AJFW	V	Top Cabinet Fixing Angle(R)	AE
607	PFLT-0016AJZZ	V	Foot Felt	AB
608	PSLDM4531AJFW	V	H/A Shield	AF
609	XEBSD30P12000	V	Screw	AA
611	XHPSD30P06WS0	V	Screw	AA
612	XJPSD30P10WS0	V	Screw	AA
615	LHLDZ1985AJZZ	V	Holder	AD
616	PSPAZ0532GEFW	V	Spacer	AL
617	LX-HZ3030GEFF	J	Screw	AA

Ref. No.	Part No.	★	Description	Code

FRONT PANEL PARTS

501	CPNLC2181TEV0	V	Front Panel Ass'y (VC-MA33A/B/D/K/L/S/W)	
	CPNLC2180TEV0	V	Front Panel Ass'y (VC-MA55A/B/D/K/L/S/W)	
	CPNLC2175TEV0	V	Front Panel Ass'y (VC-MA223R)	
	CPNLC2176TEV0	V	Front Panel Ass'y (VC-MA443R)	
501-2	HBDGB1008AJSA	J	Badge, SHARP (Except VC-MA223R, VC-MA443R)	AE
501-3	HDECQ1559AJSA	V	Cassette Flap (VC-MA33A/B/D/K/L/S/W)	
	HDECQ1558AJSB	V	Cassette Flap (VC-MA55A/B/D/K/L/S/W)	
	HDECQ1553AJSA	V	Cassette Flap (VC-MA223R)	
	HDECQ1555AJSA	V	Cassette Flap (VC-MA443R)	
501-4	HDECQ1542AJSB	V	Front Decoration Window (VC-MA33A/B/D/K/L/S/W)	AL
	HDECQ1543AJSD	V	Front Decoration Window (VC-MA55A/B/D/K/L/S/W)	AL
	HDECQ1554AJSA	V	Front Decoration Window (VC-MA223R)	AL
	HDECQ1556AJSA	V	Front Decoration Window (VC-MA443R)	AL
501-5	HDECQ1445AJSC	V	Foot Decoration(L) (VC-MA55A/B/D/K/L/S/W)	
501-6	HDECQ1468AJSC	V	Foot Decoration(R) (VC-MA55A/B/D/K/L/S/W)	
501-7	JBTN-2716AJSB	V	Button, Operate (VC-MA33A/B/D/K/L/S/W)	AE
	JBTN-2725AJSB	V	Button, Power (VC-MA55A/B/D/K/L/S/W)	AE
	JBTN-2740AJSB	V	Button, Power (VC-MA443R)	AE
501-8	CBTN-2787TEV1	V	Button A'ssy, TV/VCR (VC-MA33A/B/D/K/L/S/W)	
	CBTN-2785TEV1	V	Button A'ssy, TV/VCR (VC-MA55A/B/D/K/L/S/W)	
	CBTN-2788TEV0	V	Button A'ssy, S. Picture (VC-MA443R)	
501-8-1	JBTN-2787AJSC	V	Button, TV/VCR (VC-MA33A/B/D/K/L/S/W)	
	JBTN-2785AJSB	V	Button, TV/VCR (VC-MA55A/B/D/K/L/S/W)	
	JBTN-2789AJSA	V	Button, TV/VCR (VC-MA223R)	
	JBTN-2788AJSA	V	Button, S. Picture (VC-MA443R)	
501-8-2	HDECQ1563AJSA	V	Button, DEC (VC-MA33A/B/D/K/L/S/W)	

FRONT PANEL PARTS (Continued)

Ref. No.	Part No.	★	Description	Code
	HDECQ1562AJSA	V	Button, DEC (VC-MA55A/B/D/K/L/S/W)	
501-9	JBTN-2717AJSB	V	Button, CH (VC-MA33A/B/D/K/L/S/W)	AF
	JBTN-2726AJSB	V	Button, CH (VC-MA55A/B/D/K/L/S/W)	AF
	JBTN-2743AJSB	V	Button, CH (VC-MA223R)	AF
	JBTN-2742AJSC	V	Button, CH (VC-MA443R)	AF
501-10	MSPRD0103AJFJ	V	Flap Spring	AB
501-11	TLABZ1387AJZZ	V	Feature Label (VC-MA223R)	
	TLABZ1387AJZZ	V	Feature Label (VC-MA443R)	
502	JKNBK1092AJSB	V	Dial (VC-MA33A/B/D/K/L/S/W, VC-MA55A/B/D/K/L/S/W)	AF
	JKNBK1095AJSB	V	Dial (VC-MA223R, VC-MA443R)	AF
503	CBTN-2777TEV1	V	Button Ass'y (VC-MA33A/B/D/K/L/S/W, VC-MA55A/B/D/K/L/S/W)	
	CBTN-2784TEV0	V	Button Ass'y (VC-MA223R, VC-MA443R)	
503-1	JBTN-2777AJSF	V	Button, Stop (VC-MA33A/B/D/K/L/S/W, VC-MA55A/B/D/K/L/S/W)	
	JBTN-2777AJSF	V	Button, Stop (VC-MA223R, VC-MA443R)	
503-2	LHLDZ1964AJZZ	V	Button Holder (VC-MA33A/B/D/K/L/S/W, VC-MA55A/B/D/K/L/S/W)	AF
	LHLDZ1968AJZZ	V	Button Holder (VC-MA223R, VC-MA443R)	AF
504	JBTN-2774AJSG	V	Button, Play (VC-MA33A/B/D/K/L/S/W)	
	JBTN-1074AJSG	V	Button, Play (VC-MA55A/B/D/K/L/S/W)	
	JBTN-2783AJSA	V	Button, Play (VC-MA223R, VC-MA443R)	

OTHER PARTS

ACCESORIES

Ref. No.	Part No.	★	Description	Code
	QCNW-2702AJZZ	V	75ohm Coaxial Cable	AK
	RRMCG0126AJSA	V	Infrared Remote Control Unit (VC-MA33A/B/D/K/L/S/W, VC-MA223R)	
	RRMCG0133AJSA	V	Infrared Remote Control Unit (VC-MA55A/B/D/K/L/S/W, VC-MA443R)	
	93GHR14172001	V	Battery Cover, Infrared Remote Control Unit (VC-MA33A/B/D/K/L/S/W, VC-MA223R)	
	93GHR19472001	V	Battery Cover, Infrared Remote Control Unit (VC-MA55A/B/D/K/L/S/W, VC-MA443R)	

ACCESORIES (NOT REPLACEMENT ITEM)

Ref. No.	Part No.	★	Description	Code
	TCADS3004PEZZ	-	S-S List (VC-MA33D/55D)	—
	TINS-2943AJZZ	-	Operation Manual (VC-MA33A/B/D/K/L/S/W, VC-MA55A/B/D/K/L/S/W)	—
	TINS-2952AJZZ	-	Operation Manual (VC-MA223R)	—
	TINS-2955AJZZ	-	Operation Manual (VC-MA443R)	—
	UBATU0001AJZZ	-	Battery	—

Ref. No.	Part No.	★	Description	Code

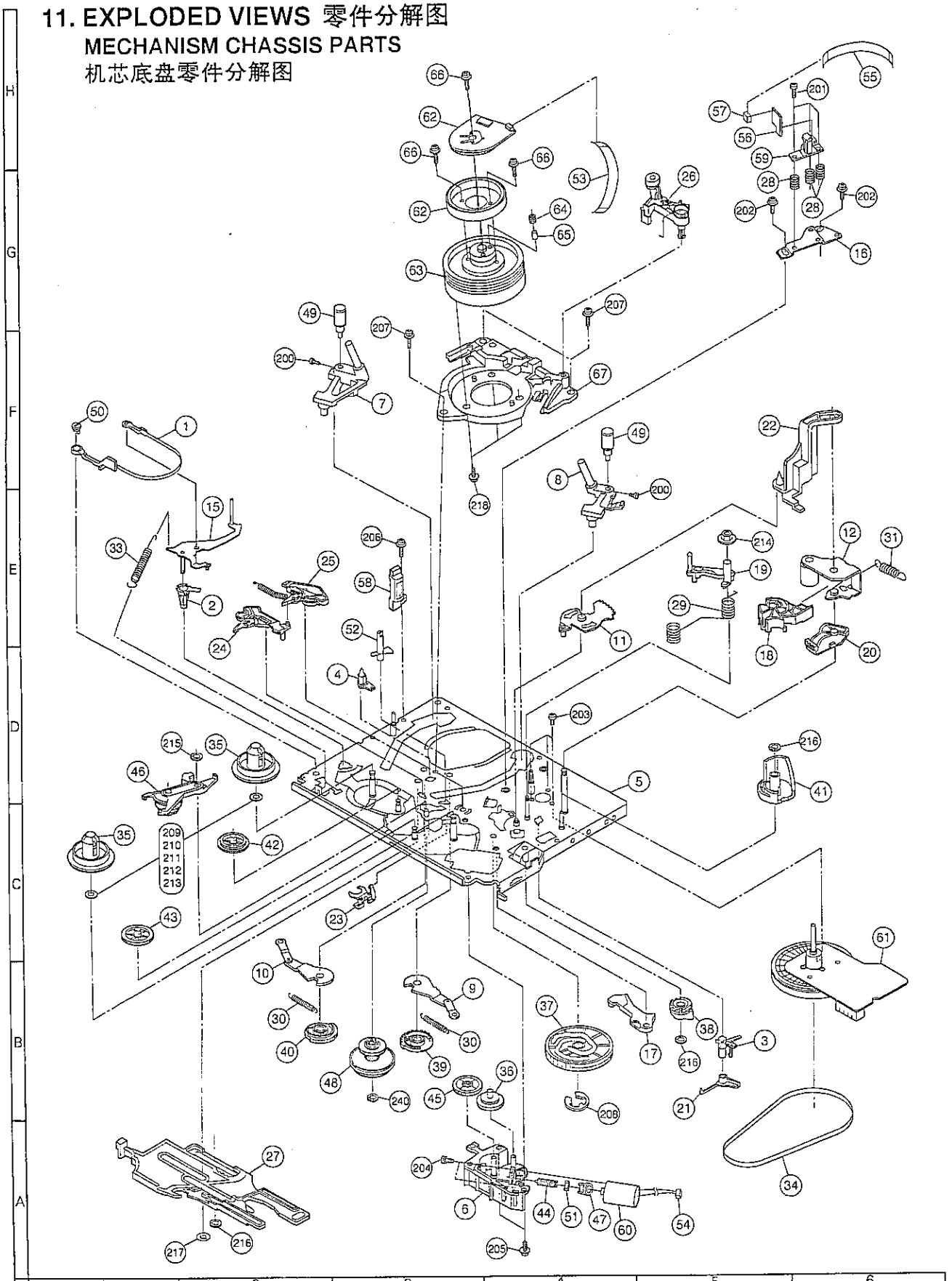
PACKING PARTS
(NOT REPLACEMENT ITEM)

	SPAKC3367AJZZ	–	Packing Case (VC-MA33A/B/S) —
	SPAKC3368AJZZ	–	Packing Case (VC-MA33D) —
	SPAKC3369AJZZ	–	Packing Case (VC-MA33K) —
	SPAKC3354AJZZ	–	Packing Case (VC-MA33L) —
	SPAKC3370AJZZ	–	Packing Case (VC-MA33W) —
	SPAKC3362AJZZ	–	Packing Case (VC-MA55A/B/S) —
	SPAKC3363AJZZ	–	Packing Case (VC-MA55D) —
	SPAKC3364AJZZ	–	Packing Case (VC-MA55K) —
	SPAKC3353AJZZ	–	Packing Case (VC-MA55L) —
	SPAKC3365AJZZ	–	Packing Case (VC-MA55W) —
	SPAKC3350AJZZ	–	Packing Case (VC-MA223R) —
	SPAKC3351AJZZ	–	Packing Case (VC-MA443R) —
	SSAKA0001AJZZ	–	Polystyrene Sack —
	SPAKX0977AJZZ	–	Buffer Material (Exccept VC-MA33W/55W) —
	SPAKX0975AJZZ	–	Buffer Material (VC-MA33W/55W) —

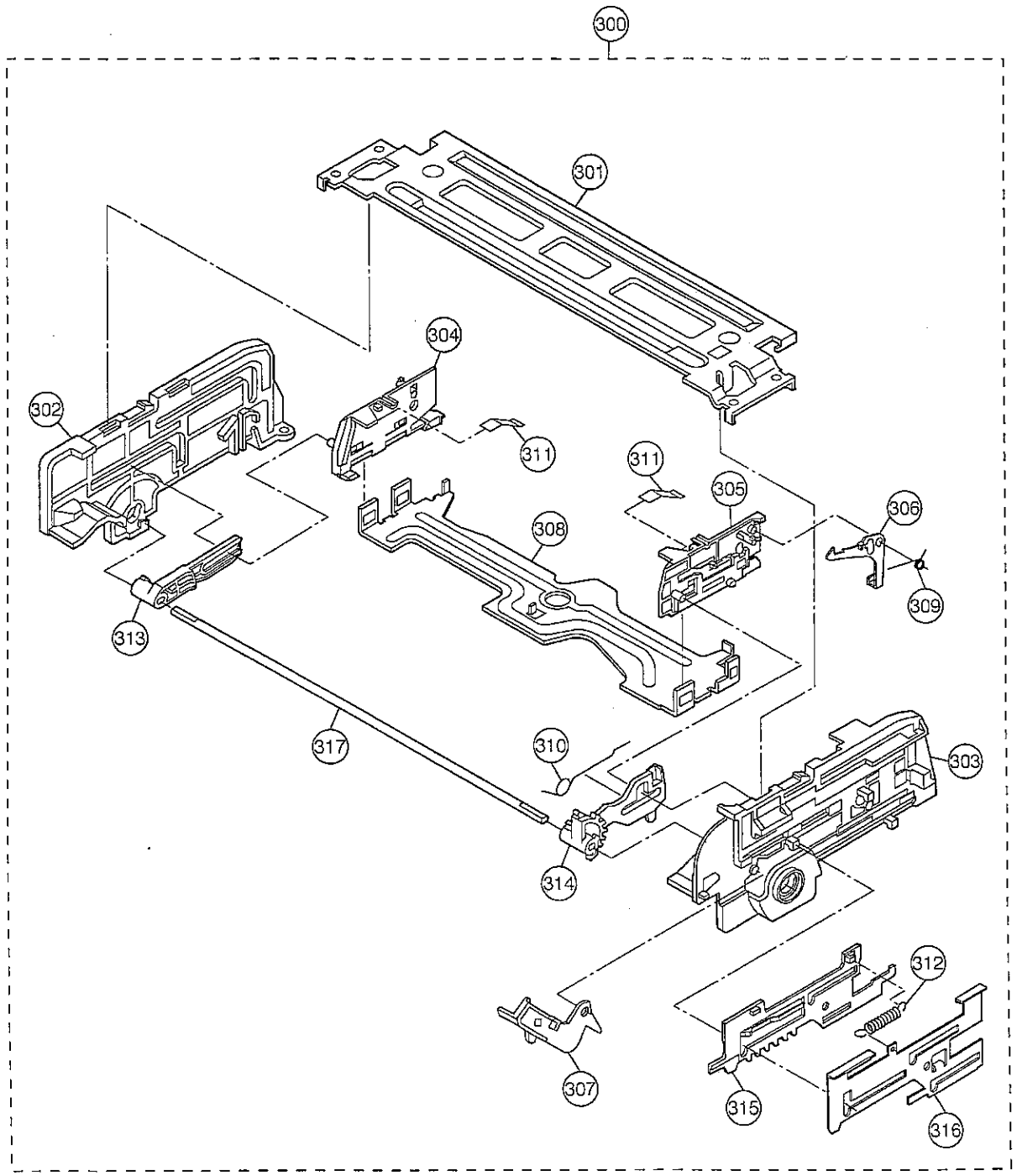
11. EXPLODED VIEWS 零件分解图

MECHANISM CHASSIS PARTS

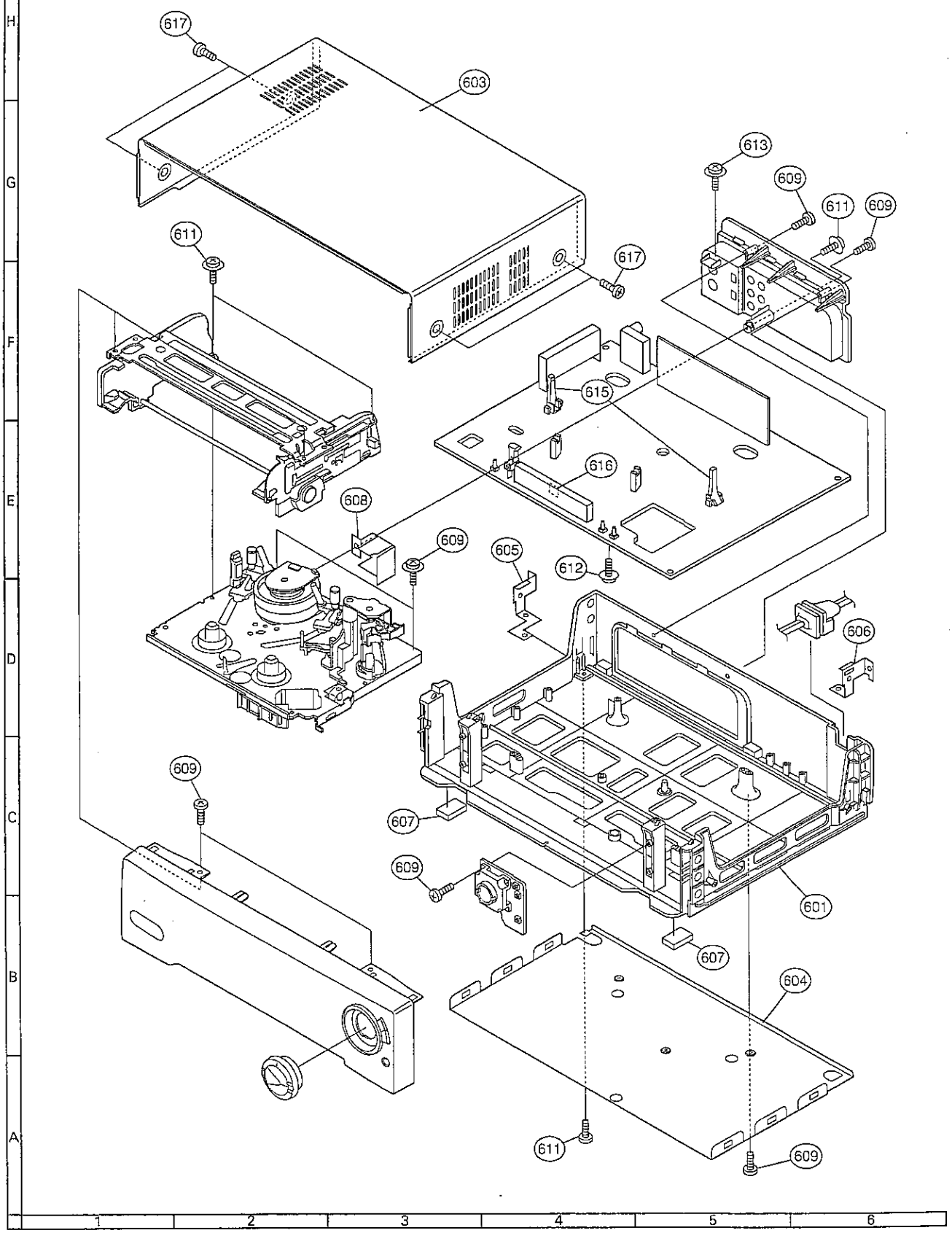
机芯底盘零件分解图



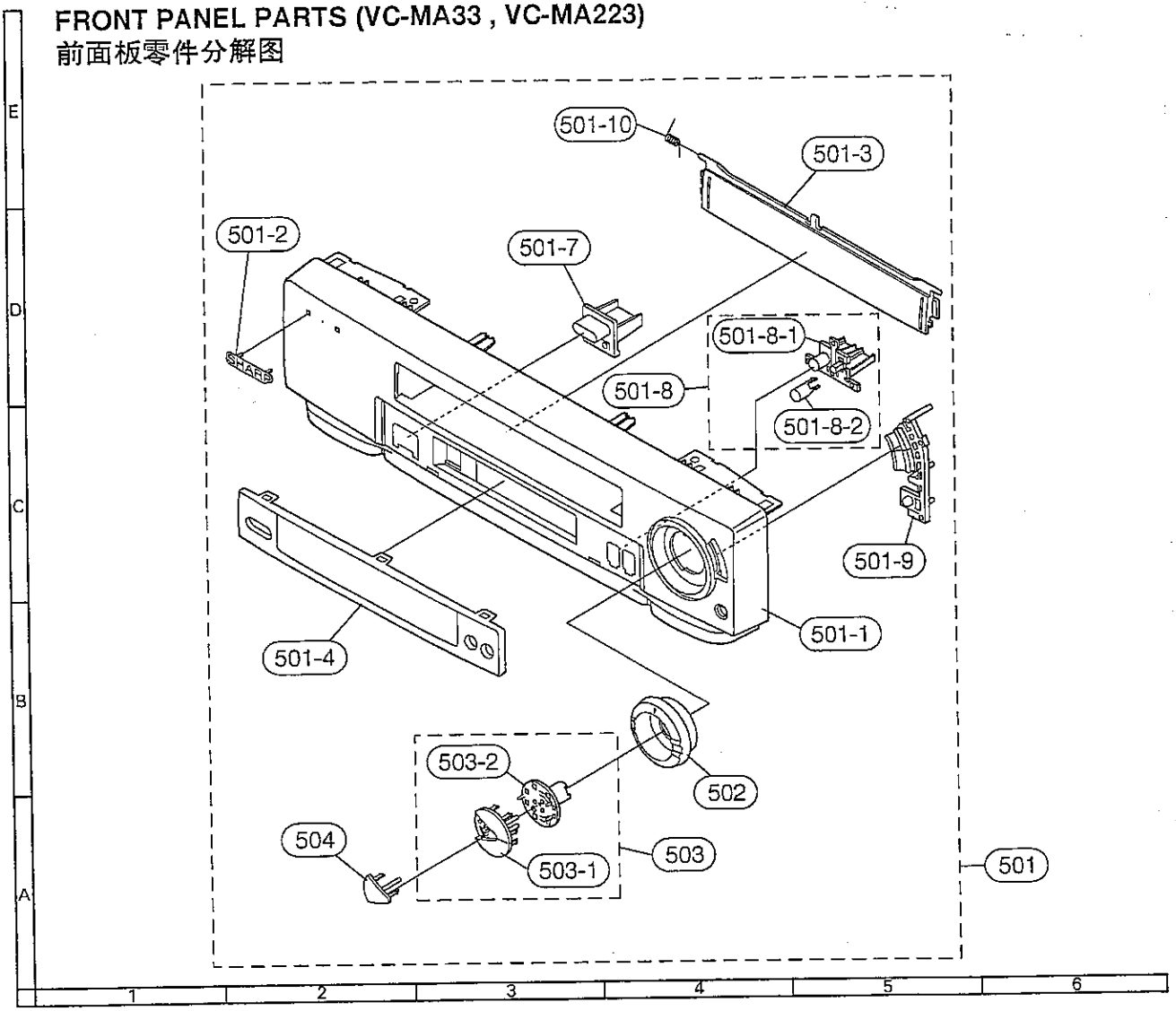
CASSETTE HOUSING CONTROL PARTS
盒室机构控制零件分解图



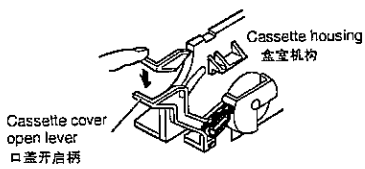
MECHANICAL PARTS
机械零件分解图



FRONT PANEL PARTS (VC-MA33 , VC-MA223)
前面板零件分解图

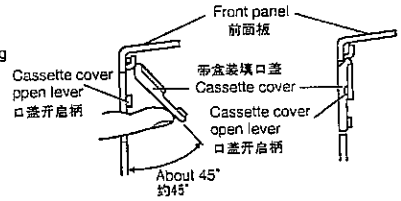


PRECAUTION ON FRONT PANEL SET-UP
前面板装配时的注意事项



Before attaching the front panel in position, make sure that the cassette cover open lever is in its right place (lower-most). If it is out of position, push it down with a finger.

安置前面板就位之前，必须先检查口盖开启柄是否置于正当位置（最下位置），否则，用手指向下按压口盖开启柄。

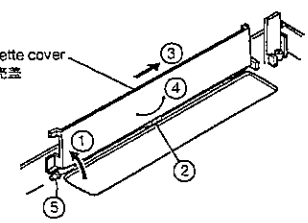


Keep the cassette over about 45° open and make sure that the cassette cover open lever is between the front panel and the cassette cover. Now fix the front panel in place.

保持将带盒装填口盖开启为约45°的状态，然后确认口盖开启柄位于前面板与带盒装填口盖之间，这样便可将前面板安装在规定位置上。

Do not mount the front panel with the cassette cover tilted too open. Otherwise the cassette cover might wrongly run on the cassette housing.

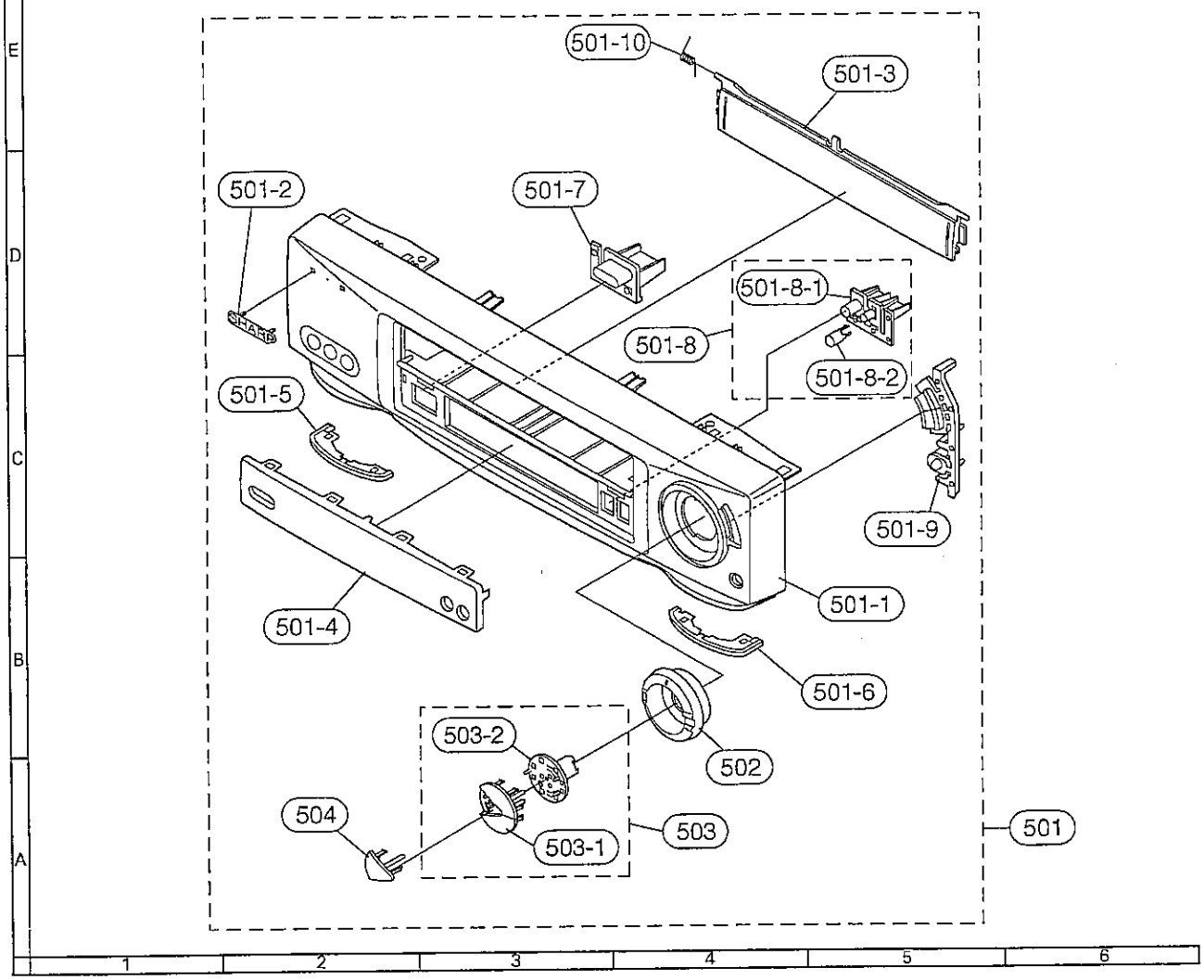
带盒装填口盖开启度过大时，切勿安装前面板，否则装填录象带于盒室机构内时，会导致其口盖开闭动作不当。



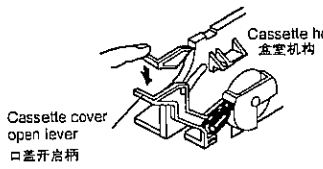
Removing the cassette compartment cover.
1 Open the cassette compartment cover fully.
2 Remove the center positioner.
3 Slide the cover to the right.
4 Slightly bend the cover.
5 Draw out the left-side rod.

盒室壳盖的拆除
①完全打开盒室壳盖。
②拆下中心位置控制器。
③向右方移动盒室壳盖。
④稍微把盒室壳盖倾斜。
⑤取出左侧杆。

FRONT PANEL PARTS (VC-MA55)
前面板零件分解图

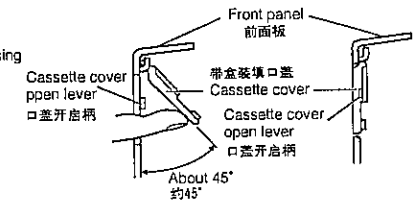


PRECAUTION ON FRONT PANEL SET-UP
前面板装配时的注意事项



Before attaching the front panel in position, make sure that the cassette cover open lever is in its right place (lowermost). If it is out of position, push it down with a finger.

安置前面板就位之前，必须先检查口盖开启柄是否置于正当位置（最下位置），否则，用手指向下按压口盖开启柄。

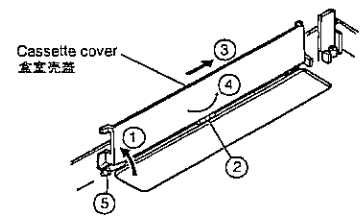


Keep the cassette over about 45° open and make sure that the cassette cover open lever is between the front panel and the cassette cover. Now fix the front panel in place.

保持将带盒装填口盖开启为约45°的状态，然后确认口盖开启柄位于前面板与带盒装填口盖之间，这样便可将前面板安装在规定位置上。

Do not mount the front panel with the cassette cover tilted too open. Otherwise the cassette cover might wrongly run on the cassette housing.

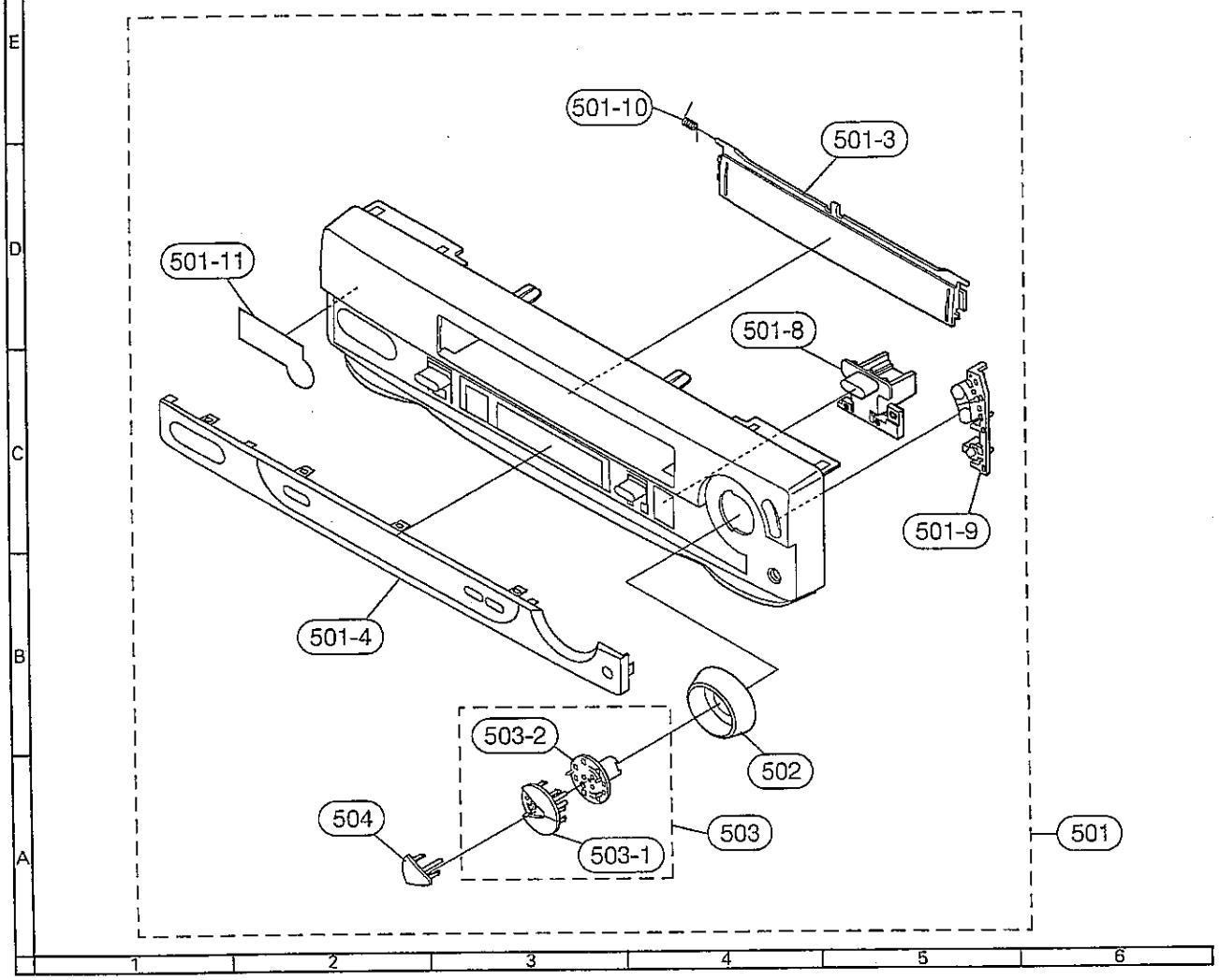
带盒装填口盖开启度过大时，切勿安装前面板，否则装填录象带于盒室机构内时，会导致其口盖开闭动作不当。



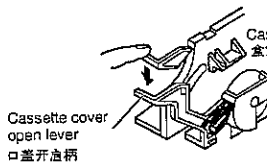
Removing the cassette compartment cover.
1 Open the cassette compartment cover fully.
2 Remove the center positioner.
3 Slide the cover to the right.
4 Slightly bend the cover.
5 Draw out the left-side rod.

盒室壳盖的拆除
①完全打开盒室壳盖。
②拆下中心位置控制器。
③向右方移动盒室壳盖。
④稍微把盒室壳盖倾斜。
⑤取出左侧杆。

FRONT PANEL PARTS (VC-MA443)
前面板零件分解图

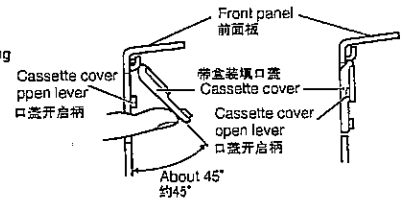


PRECAUTION ON FRONT PANEL SET-UP
前面板装配时的注意事项



Before attaching the front panel in position, make sure that the cassette cover open lever is in its right place (lower-most). If it is out of position, push it down with a finger.

安置前面板就位之前，必须先检查口盖开启柄是否置于正当位置（最下位置），否则，用手指向下按压口盖开启柄。

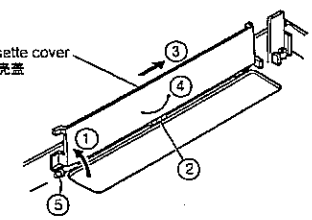


Keep the cassette over about 45° open and make sure that the cassette cover open lever is between the front panel and the cassette cover. Now fix the front panel in place.

保持将带盒装填口盖开启为约45°的状态，然后确认口盖开启柄位于前面板与带盒装填口盖之间，这样便可将前面板安装在规定位置上。

Do not mount the front panel with the cassette cover tilted too open. Otherwise the cassette cover might wrongly run on the cassette housing.

带盒装填口盖开启度过大时，切勿安装前面板，否则装填装象带于盒室机构内时，会导致其口盖开闭动作不当。



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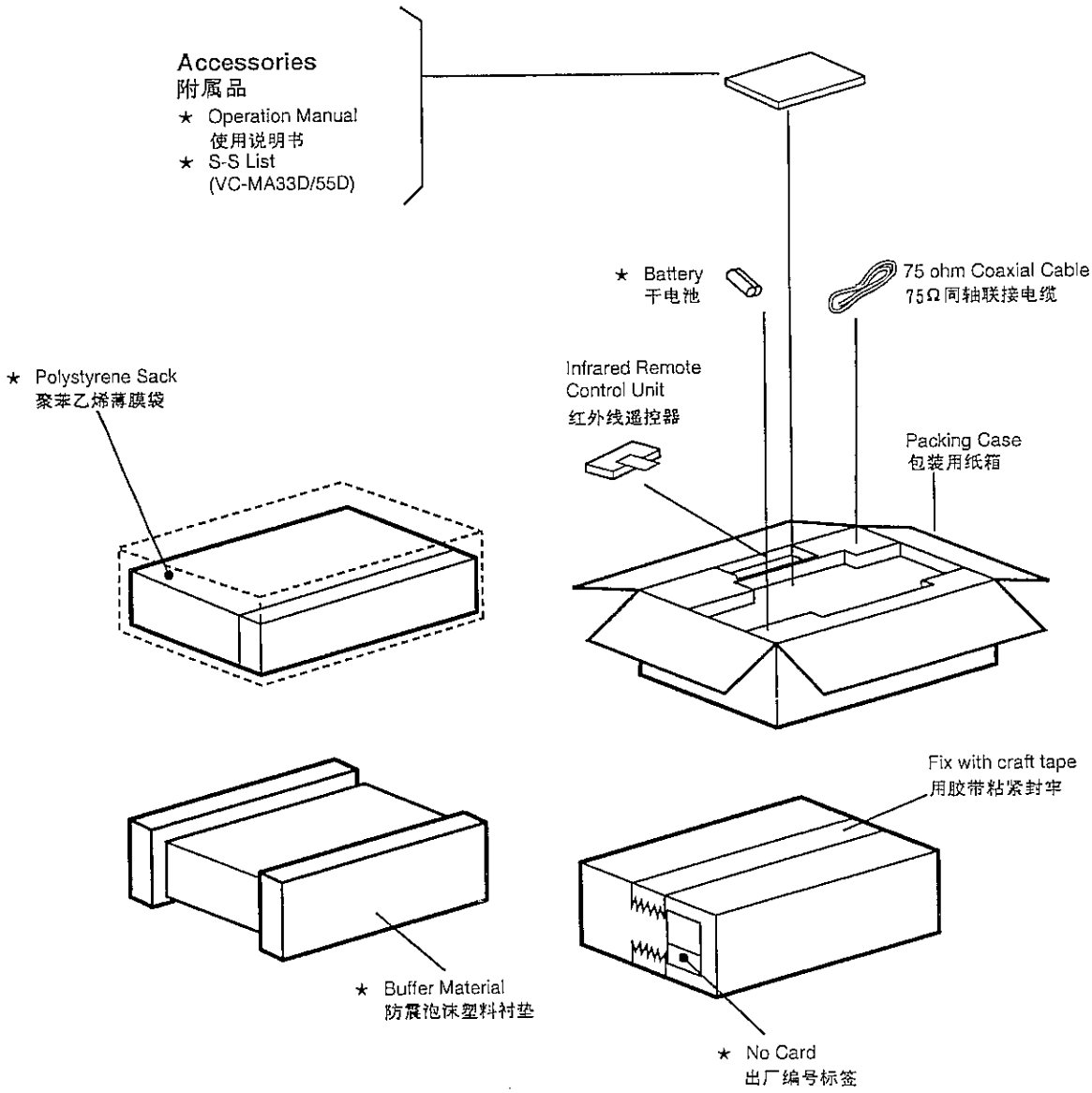
⑤取出左侧杆。

12. PACKING OF THE SET
包装方法

■ Setting position of the Knobs
各旋钮的设定位置

RF conv. CH. preset 射频变换器的预设频道	at "A37" channel 频道 "A37"
RF conv. CH. preset 射频变换器的预设频道	at "NZ2" channel



MARK ★ Not Replacement Item
★记号者为非更换品目。

VC-MA33, VC-MA55,
VC-MA223, VC-MA443

SHARP

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